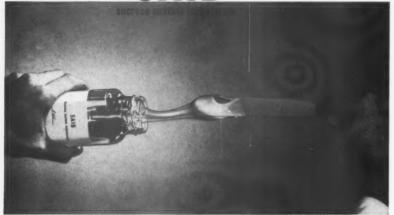
DECEMBER 1961

PAINT and VARNISH

D. H. Moran, president of Reardon, sees "homeowner-decorator" dictating choice of product and its packaging. See pg. 65.

# Unique function of SAIB aids lacquer formulators



SAIB has a molecular weight of 838. At room temperature, it is a semi-solid. Its color is exceptionally light and its color stability upon exposure to heat or ultraviolet light is excellent. (Heated to 175°C. for a period of 6 days, its color increases slowly to straw yellow, with no appreciable change occurring until after 24 hours of heat-aging.) SAIB is unaffected by contact with bronze powders. It is compatible with a wide variety of polymers, modifiers and plasticizers and is highly soluble in most common solvents. (A 90% solution of SAIB in ethyl alcohol has a viscosity of only 750 centipoises at 30°C.)

#### SAIB increases solids content

The high degree of compatibility exhibited by SAIB with virtually all major film-formers coupled with its exceptional solubility in common lacquer solvents (see table below) permits formulation of high-solids lacquers at practical application viscosities.

### **Viscosity of 50% SAIB Solutions**

 (Brookfield viscometer, 25°C.)

 Solvent
 Viscosity, cps.

 Ethyl alcohol
 8

 Isopropyl alcohol
 14

 Ethyl acetate
 8

 n-Butyl acetate
 9

 Toluene
 9

 Hexane
 6

 Methyl ethyl ketone
 6

 Methyl isobutyl ketone
 8

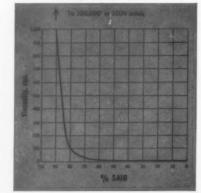
 I-Nitropropane
 11

SAIB improves film properties

One of the most significant characteristics of SAIB is its effect on film hardness at high modification. With nitrocellulose, for example, the Sward hardness of a 50% SAIB-modified film is increased from 65 to 78. Higher modification yields softer

films. Cellulose acetate films also are increased in hardness upon addition of SAIB. In this case, however, maximum hardness occurs at a concentration of about 25%. With cellulosic films other than nitrocellulose and cellulose acetate, high modification produces only a slight decrease in

## Viscosity of Solutions of SAIB in Ethyl Alcohol at 25°C.



hardness with no significant change in solution viscosity.

Other film properties can often be improved. Plastic lacquers formulated with Half-Second Butyrate and SAIB, for example, show very good adhesion to Mylar polyester film and nylon. Such lacquers can also be made heat-sealable. Vinyl and acrylic solutions when modified with SAIB show improved sprayability and less tendency toward cobwebbing, with no significant change in viscosity.

Good flexibility in many SAIBmodified polymers can be achieved by including small amounts of Eastman polymeric plasticizer NP-10.

How does SAIB function in lacquer systems?

Note that the room-temperature viscosity of a solution of SAIB in ethyl alcohol remains below 10 centipoises up to 50% solids, increasing to only 100 centipoises at 80% solids (see graph). At this point, however, the viscosity increases sharply to the 100,000+ level of pure SAIB. A.similar relationship exists between SAIB and other common lacquer solvents.

At the highest conceivable concentration at which SAIB might be used to modify a lacquer system, therefore, its effect on application viscosity is negligible. Even after much of the solvent has evaporated from the film, SAIB does not hinder flow-out or leveling. While this phenomenon might also be observed with certain plasticizers, SAIB does not exhibit plasticizing properties, hence its very limited effect on the resulting film.

Because of its unique behavior, plus its low color, stability and reasonable cost, SAIB offers a new approach to lacquer formulation. It is supplied both as a 90% solution, designated SAIB-90, and in the undiluted form, designated SAIB. For a sample of SAIB, as well as a technical report on its physical properties and performance in coatings, writt your nearest Eastman sales office of EASTMAN CHEMICAL PRODUCTS, INC., Chemicals Division, KINGS-PORT, TENNESSEE.

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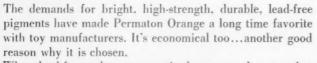




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VOLUME	51
NO. 13	

FEATURES	Industrial Perfuming, by Robert E. Wahlgren.  The sense of smell as a marketing tool for paints gains widespread interest.	3
	Alkyd Resins, Recent Trends, Part IX (Conclusion), A Staff Report Water-based alkyds are discussed in this final installment.	4
	Increase of Hiding of White Enamels by Toning, by Frederick K. Daniel.  Toning white enamels with carefully chosen and correctly proportioned colorant blends offers several advantages to the paint manufacturer.	5
	The Coating Corner, by Edward Anthony	5
PRODUCTION	Reporting System for Raw Material Samples, by Wayne R. Fuller	73
rkobocilor	A plan for keeping track of the many samples offered for evaluation.	
	Sonic Waves for Defoaming	7
	New Developments	80
	New Raw Materials and Equipment	8
	Patents	8
	Technical Bulletins	88
A EDOCOL CO A TINICO	Physico-Chemical Properties of Propellants, Part II, by Dr. John J.	
AEROSOL COATINGS	Sciarra	9
	Aerosol News and Developments	96
DEPARTMENTS	Comment	-
DEI / III III III III	PVP Management Newsletter	13
	PVP Washington Newsletter	23
	Cover Story—David H. Moran, President of The Reardon Co	65
*	News. Calendar of Events.	100
	Personnel Changes	101
The second second		100



Paint and Varnish Production Wishes Dou A Merry Christmas and a Happy New Year

PAINT and VARNISH PRODUCTION is published monthly except semi-monthly in March at Easton, Pa., by Powell Magazines, Inc., John Powell, president; Ira P. MacNair, vice-president and treasurer; Alan P. Danforth, vice-president; Alice L. Lynch, secretary. Entered as second class matter at Post Office at Easton, Pa., Jan. 30th, 1952, under the Act of March 3, 1879. SUBSCRIPTION RATES POSTPAID: United States and Canada, 1 year \$4.00; 2 years \$7.00. Mexice and Pan-American Countries, 1 year \$5.00; 2 years \$1.50. All other countries, 1 year \$5.00. Remit cash in advance, with order, by bankers draft on New York funds. SINGLE COPIES: Current issue: \$0.50; all back numbers: \$1.00. Convention issue: \$1.00. Review and Buyers' Guide: \$5.00. Bound volumes: \$15.00 per vol. when available. We cannot guarantee to supply back numbers and claims of missing numbers cannot be granteed if received more than 50 days after date of mailing. Subscribers should promptly notify circulation department of any change in address, giving both old and new addresses and by sending address label. EDITORIAL AND EXECUTIVE OFFICES: 855 Avenue of the Americas, New York 1, N. Y. Printed in U. S. A. Send Form 3579 to: POWELL MAGAZINES, INC., 855 Avenue of the Americas, New York 1, N. Y.

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#### Solubility of resins1 in Shell's PENTOXONE and PENTOXOL solvents.

1		PENToXOL Solvent	* PENToXONE Solvent
Resin	Supplier	Viscosity	, Cps., 25°C
Nitrocellulose			
R.S. 1/2-Second Grade,	_	100	67
Eight Grams per 100 Mls		1	
S.S. 1/2-Second Grade,		58	38
Eight Grams per 100 Mls			
Acryloid A-21, 15% Weight	Rohm & Haas Co.	30	22
Acryloid B-44, 15% Weight	Rohm & Haas Co.	25	20
Acryloid B-66, 15% Weight	Rohm & Haas Co.	25	15
Acryloid AT-50, 30% Weight	Rohm & Haas Co.	90	63
Bakelite BKS-2600	Union Carbide Plastics Co.	87	46
Amberol F-7	Rohm & Haas Co.	37	19
Methylon 75108	General Electric Co.	11	5
Beetle 227-8	American Cyanamid Co.	31	26
Uformite F-240	Rohm & Haas Co.	11	7
Beckamine P-196	Reichhold Chemicals Inc.	14	8
Cymel 248-8	American Cyanamid Co.	19	11
Uformite MM-55	Rohm & Haas Co.	23	14
Resimene 872	Monsanto Chemical Co.	29	16
Cellolyn 102	Hercules Powder Co.	18	9
Amberol 801	Rohm & Haas Co.	32	17
Aroplaz 2480	Archer-Daniels-Midland Co.	27	24
Rezyl 412	American Cyanamid Co.	13	14
Cellolyn 502	Hercules Powder Co.	25	19
Cellolyn 582	Hercules Powder Co.	17	12
Duraplex ND 77B	Rohm & Haas Co.	42	31
Aroplaz 6006	Archer-Daniels-Midland Co.	27	23
Cycopol 102	American Cyanamid Co.	80	62
Half-Second Butyrate 10% Weight	Eastman Chem. Products,	117	75
Vinylite XYHL, 5% Weight	Union Carbide Plastics Co.	55	
Parlon P	Hercules Powder Co.	1260	-
Buton 200	Enjay Chemical Co.		630
Epon® 1002, 50% Weight	Shell Chemical Co.	45	31
	Shell Chemical Co.	898	240
Epon® 1007	Silen Chemical Co.	229	107

(1) Commercially available resin reduced to 30 per cent weight solids, except as indicated. Viscosities of resulting solutions measured in absolute units with capillary tube viscometers.

	CH <sub>3</sub>	0
CH		-C-CH <sub>3</sub>
	OCH <sub>3</sub>	

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# EDITORIAL

#### A Special Announcement

In line with the policy of PVP to give its readers a really complete picture of the coatings field and working towards tomorrow's markets, we will begin with our January 1962 issue, the publication of a continuing editorial series on plastic coatings.

Since such material, directed to the paint industry has not been heretofore available, we feel that all paint manufacturers will find it useful, authoritative and of great value in planning the production of new products to serve this new approach to paint technology.

Plastisols, organosols, fluidized-bed coatings, rubber coatings, etc. have long been considered much a part of the paint field. And, it is with this thought in mind that we felt it appropriate that a part of PVP's editorial content should embrace developments in this fast-moving field of plastic coatings. Indeed the potential of this field is such that we feel it will require a fast pace to keep up with these new developments. For example, industry sources predict a 100% increase in volume of vinyl dispersions within the

next five years. This degree of increase becomes especially significant when one realizes that the industry has grown some 50% during the last three years.

This new editorial development will be directed by James W. Hull. Mr. Hull is a recognized authority on rubber latex, foam plastics and vinyl dispersion coatings. He is active in the Rubber Division of the American Chemical Society, and founder and past chairman and director of the Vinyl Dispersion Division of the Society of the Plastics Industry.

Subjects to be discussed in this new coverage during the first few months of 1962 will include coating steel with vinyl dispersion, polyurethane coatings, resin compounding, elastomeric coatings, plasticizers and stabilizers. These articles will be realistic and practical, and will aim to assist paint manufacturers to broaden their field of activity, which should result in increased sales and profits.

Here again, PVP gives dramatic evidence of its constant effort to bring to its readers outstanding and significant developments in the broad field of coatings technology.



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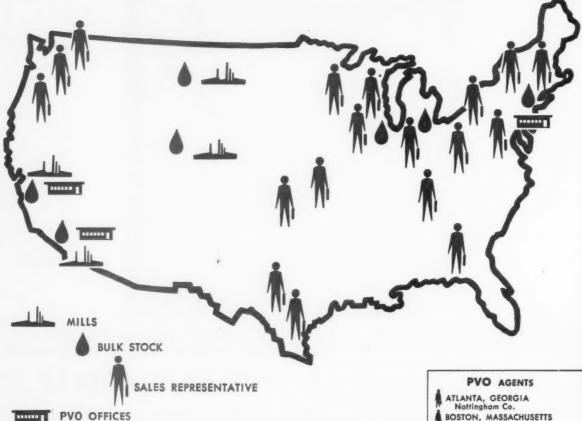
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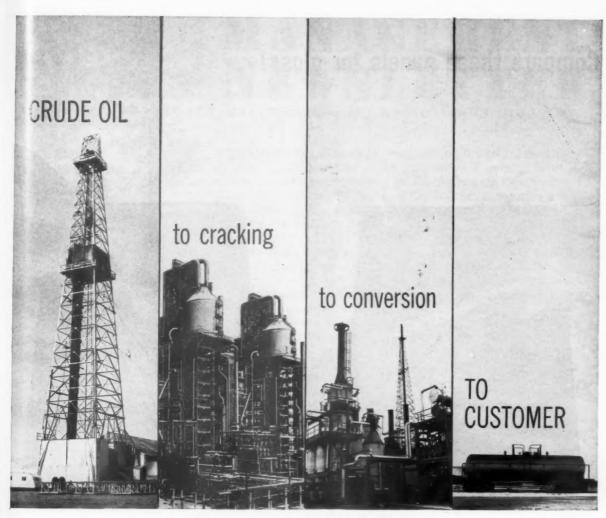
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١	Specific Gravity (20/20°C) max	. 0.793
l	Acidity, (as acetic acid-wt per cent) max.	. 0.002
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l	Water (wt per cent) max	. 0.5
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# MANAGEMENT NEWSLETTER

A MONTHLY REPORT FOR MANAGEMENT OF THE COATINGS INDUSTRY

DECEMBER, 1961

THE CONSTRUCTION industry is destined to play an increasingly important part in the building of the American economy, with an indicated level of new construction to hit \$107 billion (in 1960 dollars) in 1975, and \$219 billion in the year 2000, according to a study made by the Building Materials and Construction Industries Division, Business and Defense Services Administration, U. S. Department of Commerce. The Study, "Construction in an Expanding Economy, 1960-2000, "points out that new construction in '61 is at about the \$58 billion level. All major construction categories will share in the gains anticipated between 1960 and 1975, it says, with private residential and highway outlays more than doubling. By 2000, all types of construction except private residential and public educational will double their expected 1975 outlays. Private housing outlays are projected at \$35 billion in 1975 and \$51 billion in 2000. Public school construction expenditures, now rated at \$58 per capita in the 5-20 age group, are on the rise, and are expected to level off at about \$80 in 1975. Commercial construction, which includes office buildings and warehouse and various types of retail and service buildings, is expected to be about \$7 billion in 1975 and \$17 billion in 2000. The projected public utilities construction is \$9.2 billion in 1975 and \$22.8 billion in 2000, while highway expenditures are estimated at \$12.1 billion in 1975 and \$27.5 billion in 2000. Maintenance and repair expenditures are projected to \$31 billion in 1975 and \$70 billion in 2000, compared to the present level of about \$20 billion. They will account progressively for a smaller proportion of Gross National Product, dropping from 4 per cent in 1959 to 3.7 and 3.4 per cent in 1975 and 2000, respectively. If you want this analysis of the construction outlook for 12 major groups of private and public construction, you can get it by sending 30 cents to the U.S. Superintendent of Documents, Government Printing Office, Washington 25, D. C., asking for the September issue of Construction Review.

STRIKES during September held factory production down enough to prevent it from setting a new high record, but in spite of the plethora of work-stoppages in that month, strike activity during the first nine months of '61 was below the levels of corresponding periods since before World War II. It now seems clear that, considering the relatively minor strikes in October and November, this will be a year of record low labor strife. The Bureau of Labor Statistics has pointed out that strike idleness during the first three quarters amounted to 12.9 million man-days, compared with 16.4 million for the first nine months in '60 and 13.8 million in '58, the previous postwar low. An estimated 310 stoppages, about equally divided between manufacturing and non-manufacturing industries and involving about 334,000 workers, began in September. An additional 220 stoppages continuing from August brought the number of workers involved in all stoppages in September to 390,000. The National Labor Relations Board during October issued decisions in more contested unfair labor practice cases than in any

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ROGRESS



## MANAGEMENT NEWSLETTER

other month of its 26-year history. A total of 82 cases involving disputes over the facts or the application of the law went to decision by the five-member board, or by three-man panels appointed by it. The previous one-month decision record was disposition of 57 contested cases in which employers or unions, or both, were charged with NLRB violations.

BUOYANT REPORTS of an upturning economy notwithstanding, there is deep concern in the business community over the difficulties of meeting constantly increasing employment costs at a time when competitive conditions deny opportunities for price adjustments to cover these costs. Profit tabulations of the First National City Bank of New York bear out the recent comment of Commerce Secretary Hodges that corporate earnings are "too low" and in percentage terms "are not moving with the trend in the economy." Since profits drop faster than economic activity in a recession, they need to rise more rapidly in periods of expansion. During recent cycles the recovery of profits has been incomplete. percentage of Gross National Product, corporate profits after taxes have declined from 5.8 per cent in 1955 to 4.5 per cent in 1960. The latest figures confirm that the profit squeeze is on with a vengeance, and may not only disappoint Treasury expectations of revenues from corporations, but may also dampen the recovery in capital spending by business. Estimates that plant and equipment outlays might reach or surpass \$40 billion in 1962, up 15 per cent or more from the apparent 1961 total, are being shaved. One rapid step the Administration has taken is that in the past month the Treasury has inaugurated a program of permitting more rapid tax write-offs for capital equipment. While initially covering only the textile industry, the program is to be expanded to cover general industry according to present plans. Another measure in the works is an investment credit plan, which is part of a tax revision measure scheduled to be taken up by Congress in January. The plans call for a flat across-the-board allowance of seven or eight per cent of new investment in plant equipment.

TO ACQUAINT businessmen more fully with its enforcement work in the field of questionable advertising, the Federal Trade Commission has issued the first of a series of monthly summaries of its case work in a publication entitled Advertising Alert. (The agency hit Mary Carter Paints a few weeks ago with a cease and desist order.) Each monthly summary also will include one or more general warning stories, based on current investigations. FTC Chairman Paul Rand Dixon pointed out that it is to the advantage of both the public and the advertisers to be alerted to improper advertising at the earliest possible moment. "During the course of our investigations, the pattern of deceptive claims and practices, particularly in advertising, becomes sufficiently clear to warrant a warning to those who might be victimized, or to advertisers that might unwittingly be disseminating false or misleading ads. We believe that a better knowledge of what the Commission is doing will be helpful to them." Advertising Alert may be received upon written request to the Federal Trade Commission, Washington 25, D. C.

DRAMATIC NEWS
FOR PAINT PRODUCERS!

# Now, GENERAL announces the successful use of "C" pigments with GEN-FLO®

 Two-year <u>aging study</u> offers convincing, positive proof of long shelf life

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- Equivalent tinting strength with a substantial saving in cost of raw materials
- Hiding power equal or superior to more costly formulations

This is the news you've been waiting for. Now, General offers the *only* tested and proven styrene-butadiene paint latices that have successfully demonstrated their suitability for use with "C" pigments. This important breakthrough is backed by a continuing two-year aging study that provides convincing proof of the practicality of the process. Take advantage now of the tremendous per-gallon saving Gen-Flo offers . . . write today for full technical information.

# THE GENERAL TIRE & RUBBER COMPANY Chemical Division · Akron, Ohio Chemical Division

Chemicals for the rubber, paint, paper, textile, plastics and other industries: GENTRO SBR rubber • GENTRO-JET black masterbatch • GEN-FLO styrene-butadiene latices GEN-TAC vinyl pyridine latex • GENTHANE polyurethane elastomer • VYGEN PVC resins • KURE-BLEND TMTD masterbatch • KO-BLEND insoluble sulfur masterbatch







# Now, Arizona Chemical is geared to offer a steady rosin supply!

What better way to solve one of your most annoying materials problems? Here's Arizona's top-quality tall oil rosin now available in consistent supply...and at stable prices, too. For information, samples and prices, write Arizona Chemical Company, 30 Rockefeller Plaza, N.Y.



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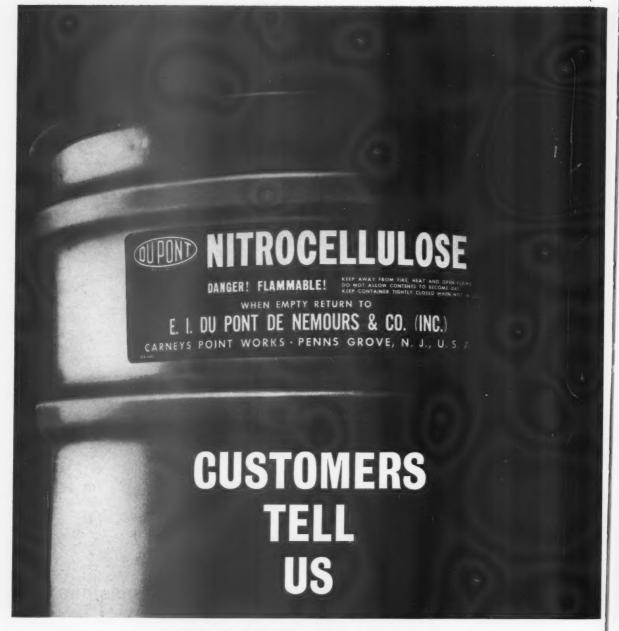
Celanese CL-204 gives you an exceptional con bration of properties for formulating better water-based paints. Its outstanding capacity for binding pigments at high pigment loading levels means lower production costs. Its superior film properties make CL 204 equally suitable for interior and exterior formulations—as well as for primer sealers. • With CL-204 film integrity, toughness, tint retention, sheen uniformity, borax compatibility, flow and leveling by brus and roller are all outstanding. As is mechanical and storage stability. • For complete details on Celanese CL-204—or other Celanese emulsions—please write, outlining your specific interest, to: Celanese Chemical Company, Dept. 558 L, 522 Fifth Ave., N.Y. 36.

Celanese Chemical Company is a Division of Celanese Corporation of America

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ALL THREE COATS



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1-4-3 (one-for-three)



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Paints made with Permox 1-4-3 are easily tinted and have excellent chalk resistance. These qualities make possible the production of durable, rust inhibitive maintenance paints and enamels in an almost unlimited assortment of contrasting colors and with superior tint retention.

Suggested formulations are available for a wide variety of these anticorrosive and decorative paints designed for specific needs. We welcome inquiries and are prompt to respond.

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# OF ZINC + RESYN 25-2243 IN EXTERIOR LATEX PAINTS

All three substrates shown above were coated with latex paints formulated with NATIONAL Resyn 25-2243—both with and without zinc oxide. They were exposed for over a year at test locations across the U.S.A. They prove the ability of zinc pigments—when combined with compatible Resyn 25-2243—to improve exterior house paint formulations by con-

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tributing greater tint retention, opacity to ultra-violet light and mildew resistance.

A reasonable level of zinc oxide plus Resyn 25-2243 also provides increased durability, mold control, and tanin-stain resistance.

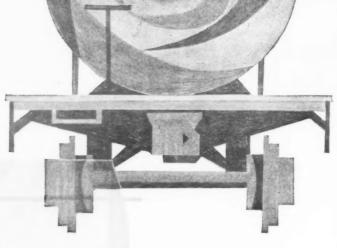
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CARBIDE CHEMICALS



# MANAGEMENT NEWSLETTER

A MONTHLY REPORT FOR MANAGEMENT OF THE COATINGS INDUSTRY

#### WASHINGTON REPORT

DECEMBER, 1961

THE ADMINISTRATION of President John F. Kennedy, which started out as a one-man affair, with a number of rather untried college graduates in strategic positions, has been undergoing significant changes during the latter part of the first half-year. Close observers say that the President has gone more and more toward "committees," in arriving at decisions, and that he is trending toward use of trained business minds, rather than men who won their spurs primarily in the political arena.

There seems to be no doubt but what, after a period of coolness toward big businessmen, the President lately has been courting the very same groups he once disdained, at least publicly. He refused to attend the U. S. Chamber of Commerce meeting last Spring in Washington, but recently agreed to address the National Association of Manufacturers. Also, he has had a series of more or less confidential meetings at the White House with big business leaders.

Most significantly, all talk about "tight money" and "low interest," a kingpin feature of his campaigning a year ago, has ceased around the White House. After a token one-fourth of one per cent cut in FHA rates, which was lost to borrowers when lenders were allowed to increase their discounts on such loans, the President seems to have lost all interest in either speeding up an increase in the money supply or causing a downtrend in interest rates. The average bank loan and home loan (figured on an annual use basis) still remains about 12 per cent, and in some areas even higher.

This may be the reason why recovery has not been taking hold as fast as the White House had hoped. Certainly, the people who have to pay this high interest, the consumers, are shown by the statistics to be quite wary about becoming free spenders, or free credit-users now, as in other years long gone.

THE LAST MONTH of '61 here finds officials of the New Frontier still perturbed at various indications that, in spite of all their efforts, there are still pressing problems on the domestic economic front.

Unemployment, for example, was slightly below 4 million in October, although there were 67.8 million persons gainfully employed. As Secretary of Labor Arthur J. Goldberg asserted: "It is disturbing that the seasonally adjusted unemployment rate remains at 6.8 per cent. This underscores that we have a stubborn and continuing unemployment problem."

Representative Thomas M. Curtis (R.-Mo.), the undisputed Republican spokesman on economic matters on Capitol Hill, was a bit less charitable about the situation than Secretary Goldberg might have wished.

"The statistics made public imply that unemployment has dropped dramatically," Representative Curtis pointed out. "But the facts are quite the reverse. Examined closely, the figures reveal that in October 350,000 more people were unemployed than were out of jobs a year earlier...The unemployment rate remained at 6.8 per



## MANAGEMENT NEWSLETTER

hundred, the same as it was in September and also up from last October's  $6.4~\mathrm{rate.}$ "

Unbiased economists are certain that recovery has set in, and that inch-by-inch gains are being made, but that it is still spotty and far from as roaring as some propaganda would indicate. Average people generally are not nearly as free-spending as they have been in other years.

While construction as a whole is ending the year on a high level (perhaps a new record was set), new private home building dawdled along at about 1.2 million in '61, nothing to write home about. Renovation picked up about one per cent in this year, compared to '60, but even here there was not nearly the free-wheeling consumer demand as some experts had hoped and predicted.

However, there is general agreement that gains were made, that the recession was whipped, and that the problem of persistent, hard-core unemployment is going to be around to challenge the ingenuity of economists and politicians for some time to come.

PUBLIC AND PRIVATE economists here believe that expenditures for capital spending on new plant and machinery in '62 will range from three to five per cent higher than it has in '61, although this dying year has not been such a washout on this score.

In fact, many close observers say that whatever recovery there has been seems to have depended more on the spending of private businessmen for new plants and equipment than on the frenzied actions taken by New Frontiersmen. They say this may explain, in part, why President Kennedy has trimmed his sails and is now getting buddy-buddy with the men who fought his election in 1960.

Actually, a high level of activity in the capital goods area usually is the most important element in overall economic expansion. If the present plans for such spending hold up, and if Uncle Sam continues to spend on an unprecedented scale, it looks like a big '62.

The outlook on federal spending, which will come close to \$89 billion in this fiscal year, ending June 30, is for an upturn. The deficit in this fiscal year is estimated at all the way from \$3.5 billion to \$9.5 billion, depending upon economic activity between now and next July 1.

Federal spending in the next fiscal year, beginning July 1, may well pass the \$90 billion a year mark. Republicans have been pointing out that Uncle Sam never has spent as much in a single fiscal year in peacetime as he is spending this year, and that only twice, during World War II, have federal expenditures during a single fiscal year gone past \$90 billion.

BUSINESS BRIEFS: The first industrial loan to be granted by the new Area Redevelopment Administration has been made to the Carbondale (Ill.) Industrial Development Corporation. It was for \$500,000 and will be used to remodel and expand a building to accommodate production facilities for a branch of the Technical Tape Corporation of New York... At least 2.4 million workers were scheduled to receive wage-rate increases under major union contracts negotiated during the first three quarters of '61, the U. S. Department of Labor stated. Millions of others, working for plants with 1,000 or fewer employees, also have won increases, but these are not reflected in the figure given.

DOW'S BASIC POSITION AS AN EPOXY RESIN SUPPLIER

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CH<sub>3</sub>

Epoxy Resins

Epoxy Resins

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Epichlorohydrin

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Epoxy Resins

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Quality control from salt to sale. Because Dow makes every raw material required for epoxy production, we have complete control over all the final properties of Dow epoxy resins. In turn, this offers you quality control advantages in coatings production.

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Ask a user of Dow epoxy resins why Dow is his preferred source. He can tell you how the consistent uniformity of Dow resins helps him produce a high quality finish with a minimum of production headaches. He might even tell you about the Dow technical assistance that's available if he needs it (it may be he's never needed it).

From any standpoint, there's good reason to select Dow as your epoxy resin supplier . . . whether because of quality, technical help, or Dow's ability to produce special epoxies to suit special customers' requirements.

Why not evaluate Dow epoxy resins? You'll find it well worth while. Write us in Midland, C/O Coatings Sales Department 1907DL12.

THE DOW CHEMICAL COMPANY





# "Shawinigan's GELVA Emulsions meet our strictest raw material requirements."

Successful paint manufacturers like Indianapolis Paint and Color know there is no substitute for really dependable raw materials. That's why they rely on GELVA Emulsions to help provide superior paint properties, including—

- · outstanding brushability and leveling.
- excellent stability and high resistance to sun, heat, rain and salt air.
- color uniformity, non-ghosting, good hiding, absence of lap marks, water spot resistance and good holdout.

Shawinigan Resins offers more than quality products to the paint manufacturer. Technical assistance from Shawinigan's surface coatings specialists is always available to help in any aspect of a customer's paint manufacturing problems. Real assistance in formulating just the right polyvinyl acetate paint—whether it is homopolymer or copolymer—is a Shawinigan specialty. Write today for further information. Shawinigan Resins Corporation, Department 4P Springfield 1, Massachusetts.

PLANNING, RESEARCH, MANUFACTURE—Shawinigan's extensive facilities and broad experience in the paint field benefit customers throughout the world.







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GELVA® Emulsions for paints by



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#### THIS 2 YEAR TEST PROVES IT!

Three formulations of Masonry Paint were prepared as follows:

- 1. A control formulation of the original paint.
- A formulation with a 10% replacement of the original vehicle with Velsicol W-617 resin.
- A formulation with a 25% replacement of the original vehicle with Velsicol W-617 resin.

The masonry paints were applied to asbestos shingles in two coats. Two panels of each paint were placed on exposure in Florida and Ohio. After two years exposure in both locations the paints on all three panels are in excellent condition! These test panels were exposed to tropical sun, salt air, rain, snow, sub zero temperatures and the analysis of a cost accountant. The facts are apparent; Velsicol W-617 resins save money in masonry paint formulations without compromising quality. WRITE NOW FOR TECHNICAL DATA AND TEST SAMPLES so that you can learn first hand how to make more money on your masonry paint products.

Work with this man . . .

Your Velsicol representative, a qualified chemist who can help you make better products for less!



FREE W-617 VELSICOL CHEMICAL CORPORATION, 330 E. Grand Ave., Chicago 11, III.
INTERNATIONAL REPRESENTATIVE: VELSICOL INTERNATIONAL CORPORATION, C.A.
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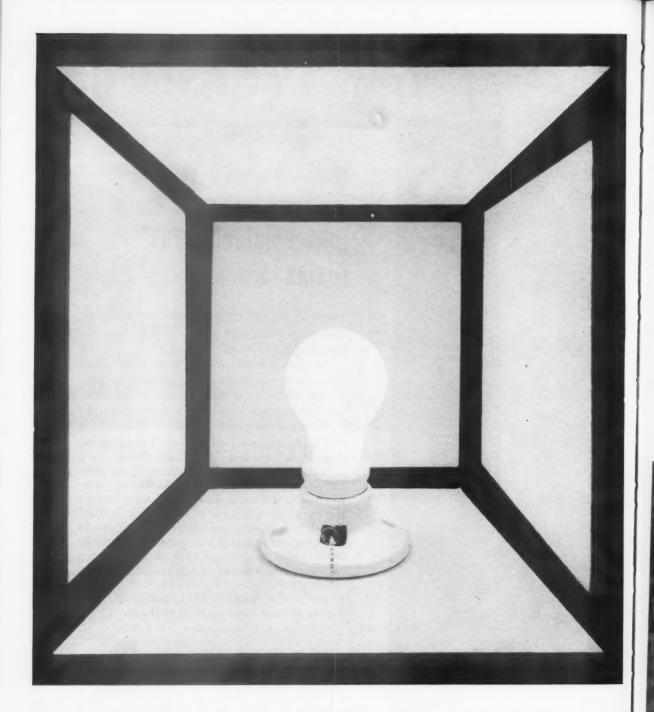
- Please send test samples of Velsicol W-617 Hydrocarbon Resins.
- ☐ Please send complete technical data. ☐ Have representative call

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## Uniform Flatting with Celite Extender Pigments

By putting the irregular particle shapes of Celite<sup>®</sup> diatomite to work, formulators are assured of exceptionally high uniformity of flatting as viewed from *any* angle.

Celite particles produce microscopic film roughness, scattering reflected light and providing a dull finish that resists polishing and glossing. Celite's high flatting efficiency provides effective and precise control of low-angle sheen in the full range

from semi-gloss to dead flat. For whatever degree of luster is required within this range, an appropriate Celite grade is available to produce durable paints of uniform appearance.

Get the full Celite story by writing Johns-Manville, Box 325, New York 16, N. Y. In Canada, Port Credit, Ont. Cable address: Johnmanvil.

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Driving snow, abrasive sleet and the wearing winter wind can make a paint look twice its age. But your outside house paints are protected and stay young many winters longer when they contain Minnesota Linseed Oil. Whether the exterior surface is wood or masonry, if the paint contains a quality linseed oil vehicle you can be sure it will withstand the severest seasons. Over and over the test of time has proved that linseed oil paints stand up under blistering and cracking best of allespecially with Minnesota, the quality brand. Find out for yourself why Minnesota Linseed Oil ranks so high for purity, quality control and dependability. Call your Minnesota Linseed Oil representative.



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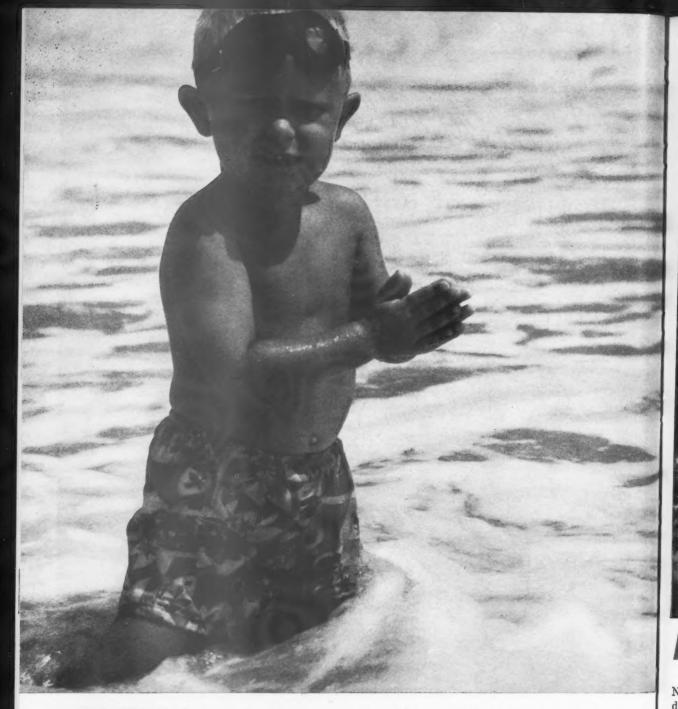
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Tree coating by Cosden Paint Co., Beverly, N. J.

# Aluminum trees are colorful with BUTON® Resins!

New BUTON resins from Enjay form the tough, durable coating that helps keep aluminum Christmas trees shining brightly. BUTON resins provide coatings with excellent adhesion to aluminum at low costs. Their ability to cure at high temperatures as well as with conventional baking permits high-speed production-line coating.

BUTON also adds extra sales appeal to many of the products that go underneath the Christmas tree. Users of appliance and automotive primers, container coatings, metal strip coatings, furniture lacquers and other surface coatings have much to gain from a closer acquaintance with BUTON resins. This versatile new resin series offers such important advantages as high gloss, rapid cure, chemical resistance and excellent adhesion, not only on aluminum, but also on an unusually wide variety of other substrates.

For application information, write to Enjay, 15 West 51st Street, New York 19, N. Y.

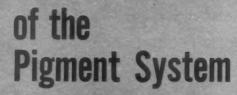
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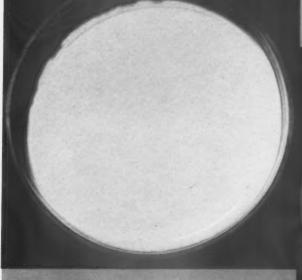
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The Petri dish test shows the two extremes in pigment dispersion properties. Magnification 3X.



# HORSE HEAD R-750 TITANIUM DIOXIDE

You wouldn't think of trying to proceed with the development of essential properties of a top-grade exterior latex paint starting with the dispersion shown on the right.

Actually, it's a highly exaggerated example of a highly unsatisfactory dispersion of a pigment system. But it does serve as a reminder of the importance of choosing for your new exterior latex formulations a titanium dioxide designed for fast and complete dispersion.

The only titanium dioxide you can afford to use is the kind shown in the dispersion on the left. And this one is no exaggeration. It's HORSE HEAD R-750 titanium dioxide and it illustrates the fast wetting and easy dispersing properties which are making this pigment the choice of an ever-increasing number of makers of emulsion-type finishes.

Why not send for a sample and make your own dispersion test?



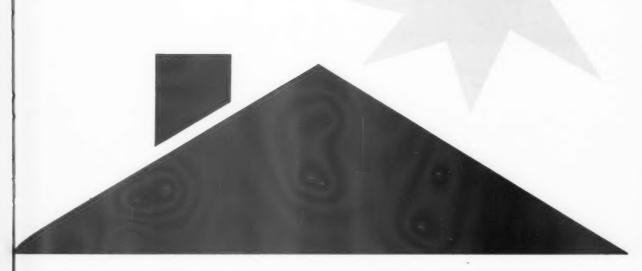
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the sellingest, most exciting development in exterior paint systems in many years

100% bodied linseed oil EMULSIFIED IN WATER

# CARGILL formula 1308

... the paint vehicle that affords the time proven advantages of linseed oil in the convenience of a water system

An unbeatable sales combination . . . the durability and adhesion of linseed oil plus the easy application and clean-up properties of water. This is *Cargill Formula 1308*—a new approach to an all-purpose exterior water based system.

Formula 1308 is 100% linseed oil in emulsion form. It is not a chemically modified oil. Rather this is a highly polymerized vacuum bodied M-25 viscosity oil which has been emulsified. Upon application Formula 1308 forms a continuous film—characteristic of timetested linseed oil. Its physical constants are as follows:



ADHERES TO BOTH CHALKY AND GLOSSY SURFACES Because of their excellent adhesion qualities, Formula 1308 paints can be applied to any previously painted surface from the glossiest to the chalkiest without any special primer. It adheres like linseed oil because it is linseed oil. It penetrates—takes hold of the substrate.

#### **DRY TIME: 30 MINUTES**

A linseed oil paint that dries in 30 minutes??? Yes!! Paints made from 1308 dry to a dust free, bug free, tack free state in 30 minutes—as soon as the water evaporates. A rain storm 30 minutes after painting will not affect the film. The film continues to cure, giving that tough weather resistant coating that is traditional with linseed oil.

#### **BLISTER RESISTANT**

Test after test shows that 1308 paints have outstanding blister resistance. They have lower permeability than latex paints and therefore protect the substrate from water. This protection plus outstanding adhesion provides excellent blister resistance.

#### WIDE VARIETY OF USES

Cargill Formula 1308 paints give excellent performance as all-purpose house paints. Their superior holdout, tint retention, and flat appearance make them outstanding as shake and shingle paints. As primers these paints give the adhesion and blister resistance of quality primers plus added mildew resistance.

#### NO PRODUCTION PROBLEMS

Paints can be made quickly and easily on conventional dispersing equipment such as a Cowles dissolver, Hockmeyer, or other high speed mill. Additionally, ball or roller mills and Morehouse mills can be used in preparing these quality paints.

PAINT WITH OIL: CLEAN UP WITH SOAP AND WATER Formula 1308 formulations achieve excellent brushing, good leveling, instant brush clean-up. You can make and market a paint with these wanted features. And you can sell this paint with complete confidence that it will give good, consistent performance and save your customers painting and clean-up time.

#### A ONE-COAT WATER SYSTEM

A one coat water paint is possible because paints made with 1308 adhere to chalky and glossy surfaces and have higher solids, good hiding, and good durability.

#### COMPATIBLE WITH ZINC OXIDE

Emulsion paint systems based on Cargill Formula 1308 are compatible with substantial quantities of zinc oxide, which traditionally impart excellent mildew resistance, better whiteness, improved tint retention, and greater long term durability.

INSENSITIVE TO WATER AFTER 30 TO 45 MINUTES Early water resistance of Formula 1308 paints is excellent. Laboratory tests show that 1308 based paints are not affected by water as early as 30 minutes after application. Commercial paint jobs confirm this. In two cases painters reported heavy rainfall 30 to 45 minutes after painting, without damage.

#### REPAINT IN 45 MINUTES

Where two coats are desired, early water resistance means that *Formula 1308* paints can be recoated in 30 to 45 minutes. Quick dry and fast recoatability mean greater merchandising advantages for you.

Dries bug free and dust free in minutes.



Excellent early water resistance. Unaffected by rain 30 minutes after application.





Soap and water clean-up. Paint with oil, clean up with soap and water.



Excellent coverage and holdout. On shakes, the paint covers the ridges, does not cake in the valleys.

Superior flow and leveling, outstanding whiteness and mildew resistance.

One coat covers most repaint surfaces quickly and easily.

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#### CARGILL FORMULA 1308 HAS PASSED A ROUGH TESTING PROGRAM . . . AND IT'S READY

Laboratory, fence and house tests have provided a rigorous program in the development of *Formula 1308*. The product has demonstrated excellent properties in all phases of testing.



Test houses in varying stages of paint failure which have been painted with 1308 based paints are performing exceptionally well. Adhesion, whiteness, and tint retention have been better than conventional house paints.



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#### **Industrial Perfuming**

by Robert E. Wahlgren\*

N their quest for a greater share of the consumer market, business men have long sought ways and means of attracting the buyer, and once having caught his or her eye, of making the initial sale and the repeat sale. The power to attract has been attributed to the product name, its colorful package, its place on the retailer's shelf and a multitude of other factors to which the market researcher attaches great importance. what seems to be forgotten in the mad rush for consumer acceptance is the product itself and, before it is clothed in beautiful containers colored to influence the judgment of the buyer and named the right way for the same purpose, the producer should examine the product to determine if it will persuade the customer to make a repeat purchase. This examination must be made not only for functional acceptability, but from the aesthetic point of view as well.

#### Odor-A Merchandising Tool

The sense of smell has often been overlooked by manufacturers as being important in the over-all marketing concept. The sensitive human nose has been ignored during the development of products for consumer use that did not directly involve the sense of smell or the sense of taste. But this policy has been proved erroneous and the sense of smell is considered as important in marketing today as are the other senses.

The realization that the sense of smell can play an important role in the sale of consumer products—a realization that has fully come to light only during the post World War II days—has changed the olfactory perceptivity of many everyday household products. The elimi-

nation of unpleasant odor has become an absolute necessity and, even when no unpleasant odor exists, a new, pleasant scent more condusive to consumer acceptance, is added. Thus, industrial perfuming came into being and "sell by smell" became another term in the salesman's vocabulary.

What are the objectives of industrial perfuming and how are they accomplished?

We can best answer this question by briefly analyzing the odor problems which exist today and the uses to which deodorants and reodorants are used. But first, let us define these terms for those to whom they are not familiar.

#### Deodorant

Webster defines a deodorant as "anything that destroys or masks offensive odors," which can refer to body odors or the malodors found in consumer products and industrial processes. The deodorization of a given product results in the removal or masking of the offensive odor by the addition of a mixture of materials which has either a recognizable or a non-descript pleasant odor. Such blends have been called "industrial deodorants" or "masking agents."

We cannot present a dictionary definition for reodorant. The dictionary does, however, define "odorize" as meaning "to make odorous; to scent; to perfume." The word "odorant" is used as a reference to any material which has an identifiable or perceptible odor. Thus, a reodorant is a product that is used to odorize something or to add an odor where previously an odor was not present. Usually, the process of reodorization involves the addition of a pleasant odor to make the product in which it is used more

appealing, but there are cases in which the process involves the addition of an unpleasant odor as in gas where the warning agent has an objectionable smell.

We must emphasize that the names "deodorant" and "reodorant" have often been used interchangeably. A deodorant can be used to odorize as well as mask by increasing the concentration. Both types are prepared basically in the same way and can have similar if not the same ingredients. For our purposes, we shall use these terms as they have been defined above.

#### Classification

We can classify the use of industrial odorants into several categories which will further help to answer the question we have posed.

 To add a distinct odor to a product for its merchandising appeal.

Many consumer tests and actual experience have proven that people can be influenced by the judicious use of smell in a multitude of products. This is true in spite of the fact that many buyers do not realize the subconscious persuading influence of the odor involved. Many products which, for years, were sold unscented are now marketed with added pleasant odors and would be rejected by the consumer without this added factor.

2. To mask a disagreeable odor in a given product whatever its cause.

The greatest consumer resistance is caused by an ill-smelling product. Such offensive odors can emanate from the basic raw material used in manufacture or from the solvents, oils or other materials used in processing. The presence of

<sup>\*</sup>Perfumer, Sindar Corp. and Givaudan-Delawanna, Inc., New York, N. Y.



Picture No. 1 (above) shows the application of the deodorized paint to a disc.

Picture No. 2 (right) shows the disc with the deodorized paint being placed in a specially prepared can.

Picture No. 3 (below) shows the actual evaluation of odor after the disc has been placed in the can.



such disagreeable odors calls for proper deodorization to make the finished product suitable for marketing.

3. To mask disagreeable odors during the processing of a product.

It is quite possible that the chemical interaction of certain materials used in processings may result in a very offensive odor. This produces rather unpleasant working conditions for employees which only the use of deodorants will correct. This type of deodorization requires somewhat different approaches than the problems in the first two categories.

Now that we have defined our terms of reference and have reviewed three categories for which



industrial odorants are used, we can explain further the steps taken to accomplish either the deodorization or reodorization of a given product. For this purpose we shall discuss the use of odorants in paints. It is obvious that each product brings with it individual problems, and what we are about to say may not be wholly applicable to every product. The procedure used for paint can, however, be generally applied in all cases.

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#### **Odorants for Paints**

Following along with the do-ityourself trend of today, it is only natural to find an ever increasing number of home decorators doing their own painting. This fact is not difficult to understand, if we consider the ease of application afforded by the many types of applicators being offered today. This, in conjunction with the improved odor of latex or rubber emulsion paints, causes many people to swerve to the idea of painting their own homes. In addition to these "life can be beautiful" features, consider the savings to homemakers that can be made possible by eliminating the high cost of skilled labor. It also gives a feeling of satisfaction which can be detected in the glance of an individual admiring his own handiwork. All this and keeping the wife happy at the same time. " 'Tis a consummation devoutly to be wish'd."

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Many of the paint producers, realizing this marketing potential, have wisely improved the odor of their products and are continually improving on them just as their research departments are continually searching for improvements in their basic paint formulations for durability, ease of application, etc. Whether they are producing the oil base paints or the newer water base paints, manufacturers are anxious to increase their sales in the home decorator market by improving the odor of their products. Even with all the improvements in their formulations to minimize unpleasant odor, there still exists the characteristic odors of the respective bases.

By the addition of carefully selected materials we may reduce still further the amount of objectionable odor inherent in the various paint formulations. Going a step further than deodorization, we may want to impart a clean fresh scent to the paint by the incorporation of a reodorant.

#### **Testing Odorants**

In order to help establish the proper odor level, we may paint the interiors of folded cardboard cartons using different concentrations of odorants. By smelling the paint during application, during the drying stages, and after drying, we will be in a better position to recommend specific con-This method may centrations. also be used to test the individual ingredients of the odorants for their suitability in the various types of paints being made. Different variations of paint evaluation methods can be obtained

from the literature. Research has been done along these lines utilizing a perforated gallon container instead of cardboard cartons. The perforations were made for the purpose of ventilation in an attempt to help simulate the conditions in a freshly painted room. The paint containing the odorants may then be applied with a brush to cardboard panels and inserted in the can for its odor evaluation. Modifications may be made as to the size and composition of the container, panels, as well as to the size of the opening in the top of the can, and the amount of paint applied to the panels. The most important requirement is that the

aromatic materials being tested are evaluated in exactly the same manner so as to indicate the relative potential for their application in paint. Methods can then be devised to provide for a more careful screening plan.

#### **Olfactory Chemicals**

The following list represents some of the aromatic materials that were found suitable by olfactory examination in a typical alkyd resin, oil base paint when tested as described above:

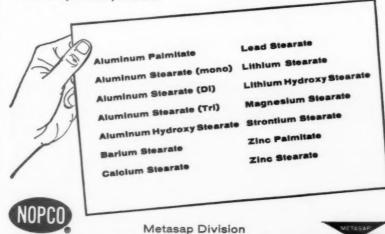
Acetophenone Amyl Acetate Amyl Cinnamic Aldehyde Anisyl Acetate

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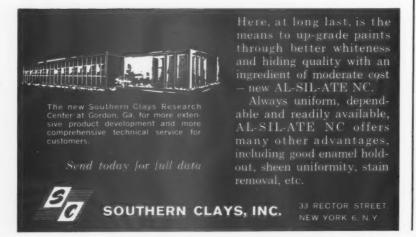
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Aubepine Liquid Benzaldehyde Benzophenone Benzyl Acetate Bois de Rose Bornyl Acetate Cade Oil Cedar Leaf Oil Cedarwood Oil Cinnamon Leaf Ceylon Citronella Java Citronellol Citronellyl Butyrate Coumarin Cyclamen Aldehyde Dimethyl Acetophenone Dimethyl Hydroquinone Ethyl Benzoate

Ethyl Salicylate Eucalyptus Oil Furfuryl Acetate Heliotropin Hydroxycitronellal Iso Bornyl Acetate Iso Butyl Undecylenate Ionone Pure **Tasmonvl** Lavandin Oil Lavender Spike Lemon Oil Linalool from Bois de Rose Linalyl Propionate Menthanyl Acetate Methyl Acetophenone Methyl Benzoate Methyl Coumarin

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A NEW CLAY WITH UNIQUE PROPERTIES FOR PAINTS AT MODERATE COST



Methyl Heptine Carbonate Methyl Heptenone Pure Methyl Hexyl Ketone Methyl Phenyl Acetate Methyl Phenyl Propionate Methyl Salicylate Neryl Acetate Nutmeg Oil Oakmoss Soluble Resin Octalactone Oenanthic Ether **Oranger Crystals** Patchouly Oil Phenyl Acetic Acid Distilled Phenyl Ethyl Acetate Phenyl Ethyl Alcohol Phenyl Ethyl Formate Phenyl Ethyl Isobutyrate Phenyl Propyl Acetate Phenyl Propyl Formate Pine Needles Siberian Safrole Spearmint Oil Styrallyl Acetate Terpinolene Terpinyl Propionate **Tolyl Acetate** Thyme Red Oil Vanillin

The above materials were evaluated at a concentration of 0.05% and were found to be generally good in minimizing the unpleasant odor found in the particular paint base employed as the test medium. It should be noted that while these materials were found suitable for this paint base, they may not perform satisfactorily in other paint formulations due to the various amounts and types of additives being utilized today. Many other materials were tested and found to be useful for the fresh or the dry notes only. These materials may also be of great importance in developing deodorants and re-odor ants for paints depending upon the specific requirements necessary to solve the odor problem involved. The aromatic materials that are to be used should be tested in the specific type of paint base requiring deodorization. In addition to testing the ingredients individually, the deodorants developed from a combination of the more successfully performing materials should be tested and evaluated in order to determine if the odorant is functioning properly. It may be necessary to decrease or increase certain items in order to fulfill the particular end use requirements. It is only by the method of testing and

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experimenting that we may become familiar with the combinations of materials that will solve the odor problem of a specific paint formulation.

If we test the constituents as well as the finished odorants in many of the paint formulations being sold today, we will acquire a vast reserve of knowledge. Based on this experience and knowledge, we are in an excellent position to make recommendations to the manufacturers of similar products. This type of test program is being carried out by many of the aromatic producers in other media as well, in order to find a wider application for their products as well as to be in a better position to serve their customers.

#### **Discoloration Problems**

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Another problem involved in developing odorants for paints is discoloration. Although the recommended concentration varies from 0.05% to 0.15%, which is fairly low, there is often the need to be very careful in the selection of ingredients in order to minimize this effect. Paints containing deodorants may be applied to small panels of wood, metal, cardboard or other materials similar to the surfaces for which the paint is recommended. These panels may then be subjected to the normal conditions of temperature, humidity, lighting, etc. found indoors along with panels treated with unperfumed paints in order to determine the effect, if any, of the deodorant on the paint with respect to discoloration as well as odor. More extreme conditions may be arranged by exposing the panels to ultraviolet light and elevated temperatures. It is not very often necessary to deodorize exterior paints for obvious reasons. However, if the paint odor is found too unpleasant during the application, it would probably be beneficial to use a paint deodorant. These exterior paints may be tested and evaluated in a Weatherometer. This device simulates the conditions found outdoors and would be very useful in testing exterior paints containing deodorants as well as the paint formulations themselves.

#### Where to Add Odorant

It is often extremely important

for the perfumer chemist involved in the scenting of industrial products to be thoroughly familiar with the processes involved during the manufacture of the products requiring deodorization or reodorization. It is frequently not sufficient for him to know only that elevated temperatures will be sustained for certain lengths of time or other bits of information. He must be familiar with the individual steps involved in the manufacture in order to develop a blend that will be both functional and economical. For example, certain products cannot have their odor problems solved by adding the odorant to the finished form. It may be necessary to incorporate the odorant directly into one of the basic ingredients before the product is finished. Specific examples of this are found in the manufacturing of rubber products such as girdles, bathing caps, rainwear, etc. On the other hand, odorants may be introduced to the finished form of a product whereby they will not be affected by the temperature or chemical reactions involved during the manufacturing process. In addition to developing the odorant and recommending the concentration required, the chemist should also recommend the best stage for incorporation in order to have the odorant perform properly in the finished product.

In general, before attempting to deodorize or reodorize an industrial product, we should think seriously about the following considerations concerning the odorant:

- 1. Ability to perform in the particular medium
- 2. Appropriate odor type
- 3. Determination of odor level
- 4. Economy
- Stage and method of incorporation

It can readily be seen that this is merely an outline from which each consideration poses additional problems that require testing and experimentation before an industrial product can be properly odorized. It is only by working with the aromatic ingredients in conjunction with the many industrial products being sold today that the chemist can increase his knowledge and develop his skill in scenting these types of materials.



We take
your product
and —
"We add the
spray, take
nothing away"

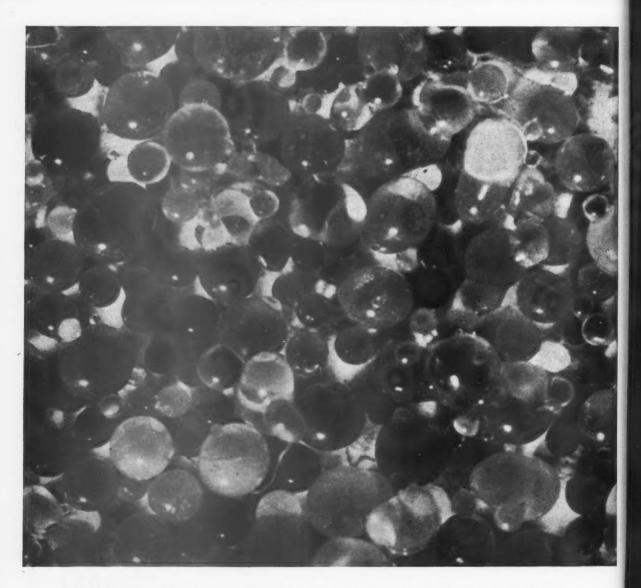


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TITANOX-RCHT helps promote the durability that keeps the paint on the road.

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For instance, using 250° at 30 min. as a standard baking schedule, your customers can reduce baking temperatures 40°—or reduce temperature 25° and time by ½. This can mean a reduction in heat costs and increased production efficiency.

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temperature cure response (as low as 180°) means you don't need a catalyst to attain proper cure. Enamel compatibility is increased and the repaired area will have greater durability.

The final finish is proof of quality performance, and bake finishes with Resimene 872 show high initial gloss<sup>1</sup> and excellent durability<sup>2</sup>. Write to us today or ask your Monsanto representative to show you the test results on Resimene 872 performance. Monsanto Chemical Company, Plastics Division, Springfield 2, Massachusetts.



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1) Gloss standards based on Initial Gloss Meter Readings. 2) Durability standards based on Gloss Meter Readings of unwashed punels after 20-month exposure.



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#### **BULLETIN:**

New Shell pocket computer helps calculate the evaporation rate of a hydrocarbon solvent in minutes—can be used right at your desk

Shell has invented a handy sixinch computer that lets you calculate solvent evaporation rates at your desk. It's called the Evapo-Rater.\*

Here's how it can save you time and help avoid costly trial and error experimentation.

FOR THE first time you can determine solvent evaporation rates without leaving your office.

Shell's new Evapo-Rater does the work for you.

#### Supplements laboratory device

For years manufacturers have been familiar with the Shell Thin Film Evaporometer—used to determine evaporation rates.

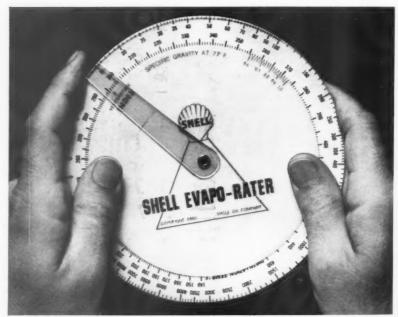
But the Evaporometer resides in laboratories. It is expensive and timeconsuming to operate. And it stands about 3 feet high.

So now Shell has invented the new six-inch Evapo-Rater, shown above.

#### Gives answer in minutes

The new Shell Evapo-Rater is based upon hydrocarbon evaporation rates determined by the Thin Film Evaporometer. It approximates results you can obtain with an Evaporometer, and gives you an answer in a matter of minutes.

The Shell Evapo-Rater makes selection of the correct hydrocarbon sol-



New Shell Evapo-Rater, above, determines solvent evaporation rates in minutes. Shell is offering the Evapo-Rater to help users select the correct hydrocarbon solvent.

vent quicker and easier than ever. It reduces the need for extensive trial and error experimentation.

#### Works for blends of solvents

And it permits you to determine the evaporation rates for *blends* of hydrocarbon solvents as well. All this can save you valuable time and money.

A limited supply of Evapo-Raters is available for solvent consumers and can be obtained from your local Shell Oil representative. Call him today. For address of nearest Shell representative, write Shell Oil Co., 50 West 50th Street, New York, N.Y.



A BULLETIN FROM SHELL
—where 1997 scientists are working
to provide better products for industry

\*Conveight 1960

#### **ALKYD RESINS -- RECENT TRENDS**

#### Part IX

#### Water Based Alkyd Vehicles

This is the final installment of the most comprehensive series of articles on alkyd resins we have had the opportunity to present to you during the past several months. It is our sincere hope that this series has given you an insight on the most recent trends taking place in this important field, and more important, what the future holds for alkyds in the coatings industry.

With the advent of the latex paints, alkyd resin growth, as has been noted several times before in this article, was inhibited. Accordingly, the alkyd chemist immediately turned his attention to formulating alkyd resins which could be combined with the latex paints. These have been discussed above under alkyd combinations. At the same time, he turned his attention to the formulation of water based alkyd vehicles which in their own right would provide films similar to solvent based alkyds. Formo and Smallwood [Paint and Varnish Production, March, 1959], have discussed the present status of water thinned alkyd resins. They review the virtues of water thinned systems which makes them so desirable for the consumer whether he be a home owner or a manufacturer. The paint maker, too, likes water based paints not only because of the lesser fire hazards but also because air pollution problems are diminished and solvent inventory is greatly simplified.

**Alkyd Emulsions** 

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Available today from alkyd suppliers are at least two alkyd emulsions for water based paints. These were intended for the "do-it-your-self" trade but at the same time research is underway to develop alkyd emulsion which may be used as primer coats and also as top-

coats for the automobile industry. Actually, an alkyd resin emulsion has recently been announced which is intended for industrial uses as an air drying or baking aqueous enamel. The vehicle is said to provide films exhibiting excellent gloss, good film integrity, and good durability.

Hensely and Layman have discussed an alkyd emulsion for architectural finishes [Paint and Varnish Production, 49, 8, 39 (1959)]. They pointed out that the early attempts to attain water based paints involved combinations of casein with alkyd resins. Such paints, however, had many defects so that the good properties of an alkyd resin finish were actually not achieved. This article describes specifically an alkyd resin emulsion which has recently become available. The product contains both anionic and nonionic emulsifiers, and has a pH of 8 to 9. Pigments may be ground directly into the emulsion without breakdown. Pigment compatibility is good, and formulations are provided for typical flat wall paints which is the important application for which this vehicle is intended. The same material has been described by West [American Paint Journal, 42, 25, March 3 (1958)].

Paints formulated from this alkyd emulsion are said to have high hiding power, excellent scrub resistance, and may be applied over old, flat, or glossy oil finishes. White paints are non-yellowing and a full range of colors are available.

Industrial finishes employing alkyd resin emulsions have been discussed by Baker [American Paint Journal, 42, 37, 86, May 26 (1958)]. This article discusses an alkyd resin emulsion intended for industrial uses where baking is possible. The author discusses means of hardening the film of the alkyd particularly by the introduction of a water soluble hard resin-morpholine combination. On baking, the morpholine is volatilized.

Recommended procedures for application of paints based on this emulsion are by dipping and flow coating. Best results are obtained when the paint is formulated at fairly low gloss levels. As gloss increases, hiding power and uniform films present problems. Also, the glossy films are more sensitive to greasy or dirty surfaces, whereas lower gloss contributes to better flow out. Discussed also is the effect of thickeners on salt spray and humidity. Work such as is described in this paper is certainly a step in the proper direction of formulating water based alkyd materials which can be utilized for industrial coatings.

#### Polyethylene Glycol

As has already been indicated, there is a great deal of patent

literature related to water dispersible alkyd resins. Typical is U. S. Patent 2,634,245 granted to R. P. Arndt. This patent describes the incorporation of a polyethylene glycol into a standard alkyd containing 45 to 55 per cent by weight of oil. The polyethylene glycols which are preferred have molecular weights of about 1500 and are included at a preferred level of fifteen to 25 per cent. They are incorporated into the alkyd at a temperature of about 200°C, with stirring until homogeneity is obtained. It is believed that actual esterification occurs between the free carboxyls of the alkyd and the

hydroxyl groups of the glycol. The progress of the reaction may be determined by checking the dispersibility of samples withdrawn from time to time during the reaction. The water dispersion is adjusted to a pH of eight or nine by the addition of ammonium hydroxide or morpholine, in order to prevent corrosion of metal containers. Pigments and driers may be incorporated into the alkyd before the addition of water or at the same time, and they may be ground on a roller mill. Also, the pigment may be incorporated into the water dispersion of the alkyd.

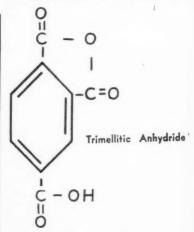
An interesting patent issued to

Robinson [U. S. Patent 2,586,092, February 19 (1959)] describes the procedure for suspending an oil or an alkyd in aqueous medium and copolymerizing it with styrene to obtain an emulsion of a surface coating vehicle.

#### Trimellitic Anhydride

An important raw material for water dispersible alkyd resin formultaions which is now in the development stage is trimellitic anhydride. Structurally, trimellitic anhydride may be considered as phthalic anhydride with an extra carboxyl group in the four position. Thus, it has the following structure:





Manufacturers of this material claim that it may be used to formulate alkyds which are water soluble and which are superior in many respects to conventional solvent based alkyds. A typical water soluble non-oil alkyd resin from this material may be formulated from trimellitic anhydride, adipic acid, and neopentyl glycol. The emulsion is prepared, utilizing the free carboxyl group of the trimellitic anhydride by converting the carboxyl to an ammonium salt which is then readily water dispersible. To make sure that excess carboxyl is present to enter into salt formation, the reaction mixture is heated until an acid number of 45 to 55 results. In order to obtain the emulsion while simultaneously forming the ammonium salt, one need only reduce the alkyd with an aqueous ammoniacal solution. The pH of such a material is six to seven, and the water dispersion is practically odorless. Such a water dispersion gives continuous films when baked at 400°F for about 25

e

minutes. Gloss is high and comparable to conventional solvent based alkyds, and color retention is excellent. Hardness, flexibility, impact resistance, water resistance, salt spray resistance, and adhesion are all comparable to similar properties in solvent based alkyds. One defect observed with this water based alkyd is that the baked films tend to show cratering and pin-holing. However, it is reported that these defects can be eliminated in TMA neopentyl resin films by using a water-soluble melamine resin in water systems and a silicone resin in solvent systems.

Water soluble alkyd resins based on TMA are capable of producing primer vehicles which are claimed to compare with epoxy ester type primers. Other advantages reported include high humidity resistance, good adhesion and adhesion on overbake with a super enamel and an acrylic lacquer topcoat plus high salt spray resistance, flexibility, impact resistance, hardness, topcoat holdout and good sanding properties. Recent work shows that new primer vehicles based on TMA will cure at 350°F. for 30 minutes, producing optimum film properties.

#### Problems

Among the problems associated with obtaining a water dispersible alkyd resin system is the need to have a sufficiently stable dispersion so that it may be thinned with either hard or soft water to any desired degree of dilution. The compositions must be easily brushable and must dry quickly to films which are as good as the films resulting from solvent based alkyds. The water dispersions must be stable to mechanical action and must have freeze-thaw stability. They must also resist mold action and must not corrode the metal Also, the emulsions must be capable of pigmentation without inversion. Of importance also is odor which must be at a minimum.

The technologist who assignment it is to convert an alkyd into a water dispersed vehicle is faced with many problems. Stability of the emulsion is, of course, one of the first of these problems. There is evidence that stability of this sort is achieved only when a combination of nonionic and anionic surfactants

are used. Each type of alkyd, of course, requires different levels of surfactant to achieve optimum stability, depending on the ratio of oil to resin present in the alkyd. Another problem that must be overcome depends upon the fact that small particle size, of course, is best achieved with low interfacial tension. On the other hand, stability requires a high modulus of elasticity. These two factors are not necessarily compatible. Even with these and other problems, technologists have made great advances in formulating acceptable water based alkyds as indicated by the availability, commercially, of at least two such materials.

Typical of the literature available

on the problems associated with the formulation of alkyd emulsions is an article by Hurd (Official Digest, October, 1956, p. 883).

A variety of water dispersible alkyds have been described in the literature. Typical are articles by Armitage and Trace [Journal of the Oil and Colour Chemists' Association, 40, 10, 849 (1957)]. An article by Durr [American Paint Journal, 42, 2, September 23 (1957), p. 106] describes a specific alkyd emulsion which is available commercially for the formulation of gloss and semigloss architectural enamels. Still another product is described by Stickle (Official Digest, January, 1959, who also discusses some of the

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problems associated with formulating emulsions from water bases and describes some of the rapidly advancing technology in this area.

To summarize the above discussion, there are now available on the market at least two alkyd resin emulsions intended for formulation of interior wall paints. Progress is also being made on the formulation of alkyd emulsions for use as industrial baking enamels. The literature contains many leads for the formulation of water based alkyds and new raw materials, such as trimellitic anhydride, are being introduced which can be helpful in this regard. Undoubtedly, the formulation of water based alkyds is one of the most important challenges with which the alkyd chemist has ever been faced.

#### Summary

This series of articles has traced alkyd resin growth and economics, both from the point of view of the finished alkyd resin and the raw materials on which the resin is based. Thus, a large amount of discussion has been devoted to raw materials for the alkyd industry. Discussed in detail also are the various combinations which alkyd resins may enter into with other film formers or protective coating ingredients. Progress which has been made recently on water based alkyd vehicles has also been described.

Early in the article some of the threats to alkyd resin growth have been delineated. Both here and throughout the remainder of the article, the point has been stressed that the greatest threat to alkyd resin growth is technology in other areas which provides new protective coating vehicles which do some jobs better than the alkyd resins do. But, just as technology is a threat, technology is also a source of strength. For continued research on alkyd resins, on their raw materials, and on the substances which they can be combined will provide the basis for strengthening alkyd technology and maintaining alkyds as a growing force in the paint industry.

In an attempt to expand the horizons of the alkyd industry, specialty as well as large volume uses must be investigated. An interesting example of a recently

announced proprietary product which falls into the specialty category is one intended for use on window panes in order to tint them. This product can be applied by spraying after the window has been installed and if properly utilized may actually eliminate the need for awnings and shades and may save on air conditioning and heating costs. The finish is sufficiently durable so that it may be washed by conventional methods once it has completely dried. Windows tinted in this fashion are said to reduce transmittal of ultraviolet rays by as much as 99 per cent.

The alkyd chemist today is looking for means to prepare alkyds which will require less complicated paint formulations. He is looking for alkyds which can be handled more conveniently, which will dry faster, which will have better "touch-up" properties, better one coat coverage, better "holdout" over porous surfaces, reduced odor, improved alkali resistance, improved chemical resistance, and better corrosion resistance. Certainly, he is working hard to formulate highly practical water dispersed systems. And he is constantly on the look-out for new technology, new chemicals, and new materials, which can be adapted to alkyd technology in order to expand alkyd horizons.

At the same time, there is need for continuing work in the areas of condensation polymerization as related to alkyd resin formation. Methods for controlling molecular weight distribution, procedures for achieving uniformity in alkyd preparation and leads for continual improvement of properties such as corrosion resistance, solvent resistance and adhesion will best be achieved by basic work aimed at trying to gain a very fundamental understanding of the alkyd resin molecule. Such work is, of course, going on and one can expect more of it in the next decade. Here the chemist makes use of all of the analytical spectroscopic and instrumental methods now available. He must utilize also the mathematical and statistical approach which is so important in polymer chemistry while still basing his operations on sound organic chemical principles.

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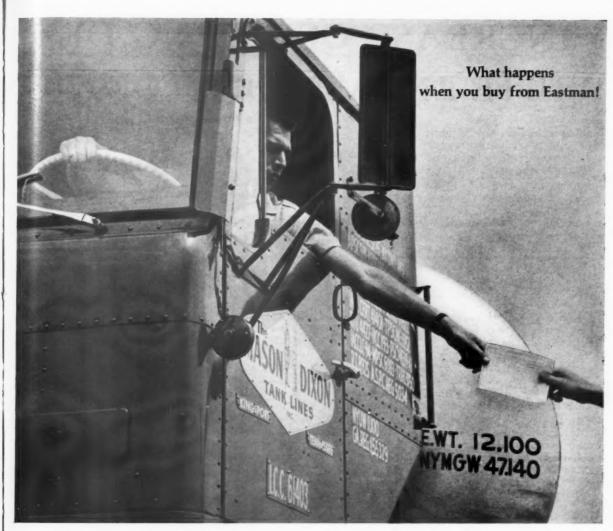
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"Like the time we filled an order for a tank truck of acetone on Saturday afternoon—and it arrived at the customer's plant before dark.

"I was busy at home (the third inning was just over) when the customer traced me through our plant switchboard operator. He had unexpectedly run out of acetone and was faced with the prospect of shutting down unless he could obtain at least enough to tide him over the weekend.

"I guess it took all of three minutes to complete two phone calls, including one back to the customer to tell him that we could make the shipment, and for him to have a crew stand by about 6:30 P.M. to unload a tank truck.

"Of course, we had a number of things working for us on this one. First, the customer's plant was only four hours away by truck. Second, he was able to catch me at home; and third, the customer had a tank truck order for acetone scheduled for Monday delivery, and this tank truck just happened to be loaded, approved, and at the terminal ready to go."

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#### INCREASE OF HIDING OF WHITE ENAMELS BY TONING

By Frederick K. Daniel\*

Toning of white enamels with carefully chosen and correctly proportioned colorant blends is described in detail.

THE toning of white enamels is a widely known method to overcome the yellowness of white enamels and to produce a more pleasing shade of white. In addition, toning can also be used to improve the quality of white enamels by increasing their hiding and diminishing the visible yellowing on ageing. The theory and practice of this kind of toning with which many paint chemists are not familiar, will be briefly described here.

#### Theory

It is well known that the hiding power of TiO<sub>2</sub> and other white pigments is due to their ability to refract and scatter incident light. The hiding power of an enamel increases with increasing TiO<sub>2</sub> content; quickly in the beginning, but then less and less until it finally reaches the point where additional TiO<sub>2</sub> produces no further increase in hiding. Therefore, it is sometimes a problem to produce enamels with sufficient hiding power, particularly in thin films as in roller or dip coating enamels.

It is likewise known that the addition of small amounts of colorants usually increases the hiding power of white enamels. The exception to this rule is yellow which causes practically no extra hiding. Beside increased hiding, the addition of colorants produces a change in the hue, commonly referred to as shade, and also a loss in lightness or value of the white (reflection). The

quantitative relationship between increased hiding, change in hue and decrease in lightness, can be controlled by the nature of the added colorant.

In the case of the frequently used ultramarine blue, the enamel goes "whiter" in the sense that the hue of the originally yellowish enamel is brought closer to the neutral point of the C.I.E. chromaticity diagram.<sup>2</sup> With further addition of ultramarine blue, the white enamel becomes distinctly blueish. The blueness of the hue becomes noticeable to the eye before the hiding is materially increased. In cases where the original vehicle itself is on the yellow side, the ultra-

marine blue produces an undesirable greenish hue. Therefore, ultramarine blue is not a very desirable toning colorant from any point of view.

An ideal toning color pigment for white enamels is one which completely reflects all wave lengths of the visible light except yellow. Such an ideal colorant, in combination with the yellow component of the vehicle and the Rutile TiO<sub>2</sub>, would produce a neutral gray which would make it possible to solve the problem in the most favorable way. This neutral gray combines the greatest possible increase in hiding with the least loss in lightness and with the least



To meet customer color requirements, paint manufacturers resort to toning methods to produce more pleasing shades of white in high quality white enamels for product applications such as household appliances.

<sup>\*</sup>Pres. of Daniel Products Co., Jersey City, N. J.

deviation from pure white. Such a gray differs from a gray produced by addition of lampblack. The latter causes merely a steep drop in lightness without a significant change in the undesirable vellowness of the enamel; or putting it the other way around, the lampblack produces less extra hiding for a given sacrifice in lightness.

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Unfortunately, there are no ideal colors which absorb only in a limited and sharply defined portion of the spectrum. Furthermore. the existing colorants give reflection curves which overlap and cause an additional loss in lightness. The closest one can come to the ideal is by means of two colorants which are called Magenta and Cyan in the printing industry.<sup>2</sup> Mixed in the right proportion, these two colrants, together with the yellow, produce an almost ideal white or light gray. Since the vellow is already present in the enamel, as was mentioned before. it becomes necessary only to add the right combination of Magenta and Cyan to produce a fairly uniform decrease in reflectance over the entire visible spectrum. Neither Magenta nor Cyan alone nor any other single color could produce the desired effect.

The hiding of an enamel toned according to this method is due, therefore, to two completely independent mechanisms, namely, the light refraction by the TiO2 on the one hand, and the light absorption through what might be regarded as an effective gray filter on the other hand.

There are only few pigments with the desired absorption curves which, in addition, have the necessary lightfastness to maintain the increase in hiding for the life of the enamel. Pigments which are not lightfast are not useable for this purpose. Besides lightfastness, good heat and chemical resistance are also frequently desired properties of good toning colorants.

Two different pigment pairs have been found which largely meet the above mentioned requirements:

1. Mineral Violet in combination with a red shade Ultramarine Blue (trade name, Tint-Ayd #233).

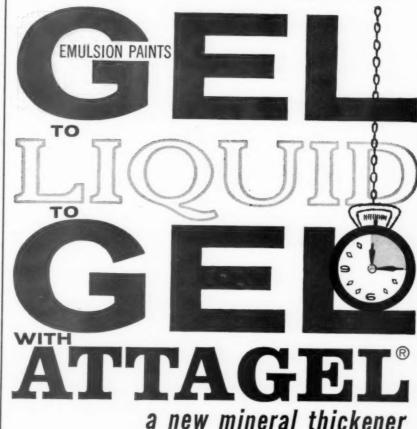
2. Carbazole Violet in com-

bination with Indanthrone Blue (trade name, Tint-Ayd #233A or Tint-Ayd #233B).

The advantage of the former pair lies in the fact that neither of the pigments tend to float to the top of the container. On the contrary, the Mineral Violet has a tendency toward hard settling which can be overcome only through exceptionally fine dispersion. Since the Mineral Violet is very hard to grind, and has low color strength, a fine non-settling dispersion free of mill discoloration can be obtained only in special equipment. This toner blend is used mostly in air dry trade sales enamels where no exceptional chemical resistance is

required and where a color separation in the can may be objectionable.

The advantage of the second toner blend lies in its exceptional lightfastness and heat stability as well as very good acid and alkali resistance. This toner blend is used primarily for baking finishes or in finishes exposed to chemical vapors or liquids. Both toner blends have good light stability; both have found increasing acceptance in the paint industry during the past years. They are used in different amounts; sometimes in small quantities and sometimes in greater amounts, depending on the main purpose of the toning.



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Types of Toning

"Minimum toning" is being used to produce the whitest, i.e., most neutral hue possible and to sacrifice as little lightness as possible. In this case, the hiding will be increased only 5%-10%, depending on the TiO2 content and the yellowness of the vehicle, but the lightness will be reduced only by 1%-2%. This "minimum toning" is used frequently in industrial enamels whose lightness must meet a specification and which enamels do not yellow much during baking. The resulting hue is similar to that of Anatase TiO2 and, therefore, makes it possible to use the better-hiding Rutile in place of Anatase.

"Maximum toning" is being used:-

- 1. to obtain the greatest possible increase in hiding, and
- 2. to obscure the yellowing caused either by baking or by ageing of air dry vehicles.

This type of toning uses a small excess of toning colors which produces a slightly violet, but pleasant, warm hue of white. In this case, the lightness is reduced by 3%-4%, but in exchange the enamel gains between 15%-20% in hiding power, depending on the TiO2 content. This full extra hiding power is sometimes used to make the best possible enamel, especially with roller coating or dipping enamels where sufficient hiding power is hard to obtain otherwise.

With trade sales enamels, on the hand, part of the TiO2 is often replaced by an equal volume of extender pigment so that the pigment volume relationship remains unchanged. In this manner the raw material cost can be reduced up to 11c/gal. without diminishing the hiding power of the enamel. Furthermore, the viscosity and application properties of the enamel can be better controlled by careful choice of the extender than in extender-free enamels. Some paint manufacturers choose a compromise between the two extremes: They save a little TiO2, but still give the customer a somewhat better hiding enamel.

Regardless of whether TiO2 is being saved or extra hiding is given to the enamel, an excess of toner blend always produces a distinct improvement in regard to the nonyellowing properties of the enamel. The greater the excess of the toner, the more yellow can be neutralized into gray. The lightness of the ageing white or off-white enamel decreases, of course, with increasing grayness, but the human eye is not as sensitive to differences in lightness as it is for differences in hue.3 Therefore, a grayish, somewhat darker white enamel, is not as objectionable as a yellowed white enamel, or one with the greenish hue obtained with an excess of Ultramarine Blue. Furthermore, it should be mentioned that the hiding of untoned enamel decreases with age, whereas correctly toned enamel increases in hiding with

In summary, it can be said that toning white enamels with carefully chosen and correctly proportioned colorant blends offers many advantages which can not be obtained in any other way. Therefore, this method of toning deserves the attention of paint chemists who have not used it up to now. It works best with white enamels, but should also be considered in other white paints below the critical P.V.C.

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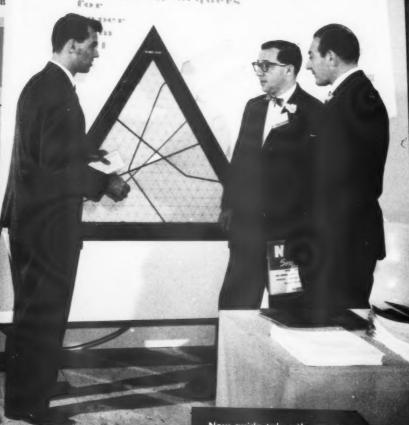
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D. L. MacAdam—J. Optical Soc. of America Vol. 32, p. 247, 1942.

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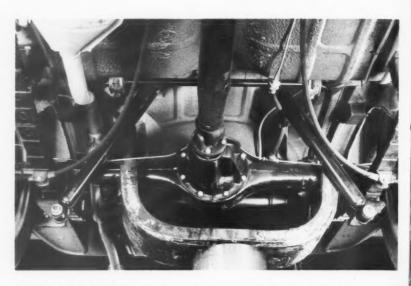
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Two new developments-In the Federation technical sessions at Washington on the morning of Friday, November 3—the Panel Discussion on Trends in New Vehicles—Dr. Walter Ropp of the Poly-

mers Department presented a paper on "Water-Dilutable Vehicles for Industrial Product Finishes." The development of such vehicles to eliminate flammable solvents is currently a hot subject.

Then, on Saturday afternoon at 3, William N. Tune of our Imperial Color Chemical & Paper Department was part of the panel on "Trends in New Pigments." His subject was "Light-fast Hansa Vellows Strontium Chemicals and Tine Yellows, Strontium Chromates, and Zinc Yellow Pigments." If you left early, you may have missed this one.

Reprints will not be available until the Federation has taken formal publication action, but details can be had from the Imperial or Polymers technical represent-

We missed the show with CSL-170. This new report is titled "Ternary Diagrams—A Guide to Predicting Optimum Performance of Lacquers." Its purpose is to turn the terrible ternary into an easyto-use tool for unlocking the mysteries of any three-component system. So many people asked us about this at the show that we suggest you write for your copy posthaste. And, incidentally, this ternary-diagram approach is the basis for the multipart study of modern lacquer formu-lations for flexible surfaces—paper, films, and foil-which we have just completed.



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This manufacturer, one of the country's lead ag makers of classroom furniture and cabinets, advertises "Durability... through every detail. Select hardwood protected by a four-coat finish... equipped with school-designed hardware... reinforced at corners and points of wear by the specialized application of modern plastics. The extensive prepolishing and four-coat finish treatment insures a high degree of adhesion, abrasion resistance, and proper light reflectance... plus all the beauty and warmth of matchedgrain select red birch veneer."

Features wanted in the finish, in addition to the rich fullness and depth needed to bring up the beauty of the red birch grain and color, included such things as: 20 ASTM cold-check cycles

without failure; a completely tough, abrasion-resistant coating with no film embrittlement after 6 months; no waterspotting or whitening after 200 hours' exposure; a high degree of resistance to both solvents and chemicals; and easy application by spray, roller, or curtain-coating.

The finish, supplied by one of the country's top manufacturers, has been in successful use for well over a year, despite continuing evaluation and a search for "something better." It is a catalystactivated, urea-modified nitrocellulose lacquer. What's more, it has a pot life, at 80°F. or below, of 2 to 4 weeks after the catalyst is added! Naturally, we cannot tell you how this lacquer is made, but we believe that some of the clues can be found in CSL-148B, "Formulation of Nitrocellulose Furniture Lacquers to Resist Water, Alcohol, and Solvents."





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#### FOR THE RECORD

So much went on at this year's Paint Show in Washington that no one could possibly absorb it all. Judging by the crowds in the Hercules exhibit almost every minute from the opening whistle until the last light went out, everyone took home some useful information. Certainly the Hercules men who attended learned much from this concentrated contact with today's trade problems. But,

due to press of time, many of our visitors went away with only some of their questions answered.

So here, for the record and for your full information, is a complete listing of what was new from Hercules, in the form of literature now available for the asking. Check it over; see if you missed anything.

Optical Bleach in Clear Lac- quer Whitens Light Finishes	CSL-173A	PE Alkyds in Metallic Auto- motive Enamels
The "Hot Interface" Technique for Coating, Decorat-	CSL-174A	Stabilized Clear Nitrocellu- lose Lacquers
ing, and Printing Polyolefin Plastics	CSL-175	Air-Drying Urethane Finishes from PE and Pamak
Heat-Sealing Lacquers	M-332	Infrared Spectrograms Are
Formulation Guide to FDA-		Film-Former Fingerprints
Acceptable Lacquers for Food Packaging	VC-428	Use of Natrosol in Water- Based Paints
Formulation of Aerosol Lacquers	PC-101	Hercules Pine Oils in Pig- mented Finishes
Ternary Diagrams	PC-106	Vinsol Emulsion in Industrial Finishes
Scuff-Resistant Lacquers		Finishes
Based on Nitrocellulose	Imperial	Empress Yellows
Utility of PE-TOFA Alkyds in the 53 to 85% Oil-Length	Imperial	Regal Yellows
Range	Imperial	X-3145, Empress Yellow 1
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#### By Edward Anthony

The author expresses his random reflections on various aspects of the paint industry. The opinions contained in this column are his alone and do not necessarily reflect those of this publication.

#### **Increasing Knowledge**

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UR children have reached an age at which the questions-and their desire for quite detailed answers-not only come with not-quite-annoying rapidity and incorporate startling breadth and depth of insight but, frankly, tax my ability to recall the correct answers (if, indeed, I ever knew the proper explanations). I think that an important factor contributing to this new generation's wide-ranging knowledge is that almost unbelievable wonder, television. Now I know it can be an electronic horror. At its worst it is a loathsome, noisesome, intrusive divider of families; however, I must admit that judicious program selection-and this can mean getting up at six in the morning or missing the end of an exciting Sunday pro-football gameoffers young ones an encompassing eye on the world around us that our own background can not match.

But those rare questions a properly informed parent can't quite clarify are usually taken care of by the set of encyclopedic books purchased from some fellow working his way through college or at the local supermarket—if you had not won one from Information, Please (remember that program?) eons ago!

Seriously, knowing where and how to look for information is a prerequisite in today's inter-related society. Particularly is this true in the field of science wherein the growth of new knowledge is expanding at an almost unbelievable rate. D. B. Baker, Director, Chemical Abstracts Service, points out in "Growth of Chemical Literature-Past, Present, and Future" (Chemical and Engineering News, July 17, 1961), that in the specific discipline of most interest to our profession, as represented by Chemical Abstracts, literature resulting from chemical and chemical engineering research has grown exponentially for over fifty years.

Baker highlights this growth statistically. Thus, the number of journals abstracted has grown from 475 in C. A.'s first year of 1907 to 9800 in 1960. New jour-

nals printing technical articles on chemistry are increasing at a 500per-year rate. Less than 8000 abstracted articles that first year compares with over 132,000 last year. Almost 100,000 new chemical compounds are reported each year; the total is in the neighborhood of half-a-million inorganic compounds and a staggering 1.75 million organic! Little wonder that coding systems have received such intensive study leading to electro-mechanical information systems, for these "brains" are the only way one could possibly keep track of this enormous storehouse of knowledge.

A number of large corporations and universities are bending considerable efforts toward organizing systems for the collection and retention of information pertinent to their particular fields of interest. And no wonder; research is a costly item of business-though of course, it's yield is priceless! Consider Baker's projection: "At an estimated cost of \$30,000 per research project (fundamental and applied) culminating in a published report, the 132,000 abstracts in C. A. last year were based on chemical investigations that cost about \$4 billion to carry out." The total to be spent on technological research in the United States this year will be \$13-14 billions (Chemical Week, Feb. 4, 1961, p. 61)-about the same as will be spent on advertising. Latest exact figures compiled show privately performed research and development has grown from \$4.2 billion in 1953 to \$10.7 billion in 1959; government performed research and development was up from \$970 million in '53 to \$1.8 billion in '59, though the latter's contribution is over half of the total spent. These amounts represent an increase from 1.4 per cent of the gross national product in the earlier year to 2.6 per cent in 1959 (Chemical and Engineering News, April 10, 1961, p. 24).

If one were to use the 1957 breakdown as a guide (the latest year for which precise statistics are available, via a National Science Foundation survey, reported in C. & E. N., Dec. 5, 1960), the chemical industry is fifth in its research and development expenditures—left behind the aircraft,

electrical, transportation, and machinery groups—accounting for 8.3 per cent of the total. This may be modified by considering the preliminary figures for 1960, which show the "chemical and allied products" grouping to have pushed up to third ranking at about 9.5 per cent of total research and development expenditures (C. & E. N., Jan. 23. 1961, p. 23). If a 10 per cent portion of the total is applied to and projected for 1961, about \$1.3 billion will have been poured into the chemical industry's unending search for better products this year.

Of course, these guesstimates

involve some conjecture—but probably no more so than market researchers do every day—and if you will indulge me a few additional calculations we can arrive at some interesting figures for our own coatings industry.

Consider, if you will, that 1961 will see total chemical sales hit \$29 billion and that the paint portion will be \$1.8 billion, about 6.2 per cent of the over-all category. Based on sales only, the research and development for our industry should approximate \$80 million this year! This sum represents about 4.5 per cent of sales and a maintenance cost of \$20,000 per

year for each of the 3900-plus members of the Federation of Societies for Paint Technology—both figures are logical and serve as backing for the validity of the assumptions. (See *Chemical Week's* article, "Research Costs," Feb. 4, 1961.)

I must admit to coming a long and devious path from my initial reflections on learning and on pyramiding of technical literature -but I, at least, certainly found the results informative and illuminating. It is encouraging to realize that, not only the coatings industry in general but also our jobs in particular, are being backed up-insured-by this investment in the future. In addition, an equally interesting total is funneled toward our industry from our raw material suppliers, the manufacturers of resins, solvents, pigments, and additives (no-I won't try to estimate this total).

#### Literature Again

TATHILE I won't make any effort to neatly tie in technological expenditures and technological literature, I would like to offer a few more lines concerning the latter. A Case Institute of Technology study (reported in C. & E. N., Feb. 27, 1961) showed that about two per cent of a scientists' waking hours are spent in readingtwo hours of 90 (one can only conclude that Sunday is indeed a true day of rest!). The 701 chemists and physicists involved spent half their reading time perusing ten journals of a total of 169 different periodicals that they read. Further, the chemist spent about two-thirds of his reading time in undirected browsing, only about one-third in hunting for specific information.

My own feeling is that occupational reading takes a greater proportion of time than the survey indicates and that a total of ten periodicals is about all one can digest in a week. Then there are the occasional books that should be skimmed so that one is aware of their contents for later selective intensive reading. All in all, keeping up with the scientific Joneses can be an exhausting and difficult task.

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**Art and Application** 

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If you have ever stood bemused before a non-objective painting, but retreated from playing the bumpkin by asking, "What is it?", take heart! This writer recently joined a theaterful of patrons in guffawing at an award-winning short film titled, "The Day of the Painter." Don't miss it. Here you learn the secret of it all.

Spread an enormous canvas with great gobs of paint in all its hues and with gay abandon dash about upon it with an oversized push broom. The final touch, a jig-saw with which to cut the finished masterpiece into separate, smaller canvases. Who knows, you too may hang in the Louvre.

But if you don't like this relatively inefficient-but highly renumerative-method of painting, consider the robot painter developed by Esso Research (Chemical Week, Aug. 5, 1961). Imagine an Army tank equipped with magnetic treads capable of rolling along the verticle walls of big storage tanks or ship hulls; incorporate a pressurized roller device for applying paint; insure safety by driving it with an air operated turbine; and control it by means of pneumatic devicesthere you have the latest mechanical application marvel or, perhaps, an object from outer space!

Another fascinating and ingenious method of applying an organic finish was observed by this sidewalk superintendent the other day. This is the flow-coating technique developed to coat glass windows with a specifically formulated ultraviolet-screening finish. These transparent coatings not only prevent display objects from premature fading and aging, they also minimize glare and decrease heat absorption, thereby opening new vistas in home, office and factory. These utilitarian finishes can actually significantly decrease the burden on an air conditioning sys-

Material is pumped to a nozzle which produces a gentle bubble-free stream. The paint flows down the window and the excess is trapped in a trough at the bottom to be recirculated. Simple enough; just that touch of imagination to turn an idea into reality.

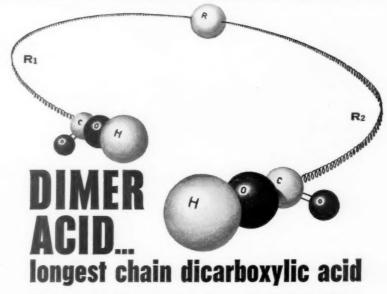
Improving Metal

O protect metals from certain detrimental environmental influences-corrosion, particularlyis one of the two main purposes for applying an organic coating (beautification being the other reason) to such a substrate. It would not seem likely that these thin coatings could materially affect such a seemingly inherent quality of metal as fatigue strength. But along come investigators Frankel, Bennett and Holshouser of the National Bureau of Standards with evidence that certain polar compounds they tested did indeed remarkably upgrade fatigue strength.

Their experimentation, to be re-

ported in the research journal of the N.B.S. and summarized in *Products Finishing* (July, 1961, p. 78), shows that the twelve-carbon containing compound, dodecylamine, had a decided affect whether the specimen tested was immersed in the organic substance or merely coated with it. An eight and an eleven-carbon containing compound had little beneficial affect, as was also the case with nonpolar compounds.

Is it not conceivable that specifically formulated coatings could be devised to take advantage of this phenomenon, in addition to the many other benefits imparted? Surely, a fertile field for study.



Three important things happen when you use Emery's Empol® Dimer Acids in surface coatings.

One, you get unusual flexibility because dimer is the longest chain dicarboxylic acid available—about twice as long as the next longest dibasic.

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The increasing consumption of this  $C_{36}$  dicarboxylic acid in surface coating uses is impressive. Primary uses to date are in polyamide and polyester resins, and as a modifier to partially replace drying acids and oils. In many applications it is being substituted for other dibasic acids to alter physical characteristics of the coating.

Four grades, Empols 1014, 1018, 1022, and 1024 are available. Gardner colors are as low as 5-6 and trimer contents range from 5% to 25%. Send for complete information on these products. If you'll outline your application, we'll recommend the grade that is most likely to meet your requirements. Just write Dept. X-12.



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Pigment Scarlet		_	_	
Permagen Scarlet			-	
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<sup>\*</sup> A partial listing of pigments from GDC. For further information contact your local GDC Technical Service Representative.



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Kentucky Color

DIVISION

The Harshaw Chemical Company
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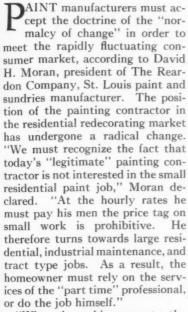
Write for Bulletin #32, Kentucky Color's Lead-Free Color Bulletin, containing basic information on lead-free color systems.



#### **COVER STORY**

#### DAVID H. MORAN

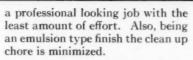
# Explores the Do-it-Yourself Market



"What does this mean to the manufacturer? Only one thing. The homeowner dictates his choice of product, its packaging, and its presentation. The homeowner no longer relies on outside help, because, after one experience with the dubious talents and materials of the "pot and brush" part time "professional," he has generally become a full fledged do-it-yourself home decorator. Today he represents about 85% of the market. The doit-vourself handyman of ten years ago has become the experienced home craftsman of today. He has a sophisticated knowledge of a wide range of techniques and materials. He's not easily sold, in fact he has become a shrewd, discriminating buyer."

Moran says the firms who will be successful in this new "home craftsman" market are those who direct their research towards high performance, easy to use products tailored to the present and future needs of the user. He stated further that his own company maintains a fully staffed central research laboratory, in St. Louis, equipped with the most advanced testing and evaluation equipment. This laboratory is completely separate from raw material and finished product control laboratories, and devotes 90% of its efforts towards the development and improvement of products currently in use, and 10% towards pure research. Moran warned that the company of today that is not using research to anticipate the wants of tomorrow's consumers is gambling with its future.

Reardon products, he pointed out, are developed on the basis of tailoring the product to the need and wants of the buyer. A case in point is Reardon's new Bondex Multi-Surface Acrylic House Paint. This new paint makes it possible for the user to purchase one top quality paint for all exterior and interior wall surfaces. The built-in "ease of application" makes it possible for the householder with a minimum of experience to produce

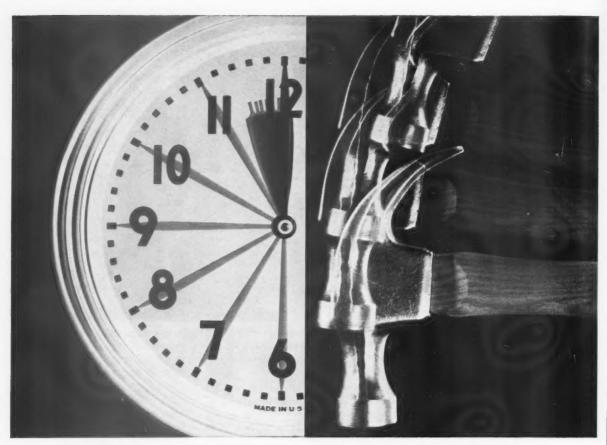


"We put the same kind of thinking to work in the introduction of our two new interior finishes, supplied in matching colors," he said. "We call them "The Bontone Twins," because they're made to go together wherever the job calls for a flat paint for the wall and a semigloss for the trim.

Our latex wall paint, Bontone Interior Latex, was formulated to provide as nearly as possible the 'ideal" finish, from choice of decorator approved colors, to superior hiding and scrubbability factors. The Bontone Semi-Gloss Enamel, in our opinion, is the first really successful latex formulation. It embodies all of the advantages of oil based enamels plus the ease of application and soap and water clean up associated with emulsion finishes. We think we have succeeded in producing paints that anyone can use successfully. In short, the type of product the "home craftsman" wants and

Dave Moran has been quite active in industry affairs at both the local and national level having served as president and director of the St. Louis Paint Association and as a member of the Board of Directors and Executive Committee of the National Association.





fastest drying?

hardest finish?

#### SPECIFY CARGILL POLYURETHANE 1459

Polyurethane 1459 is outstanding for its exceedingly fast dry and toughness. A rare combination, these qualities make Polyurethane 1459 a natural choice for superior varnishes for floors, production-line finishes for wood, and in industrial primers.

More and more manufacturers are switching to Cargill's Polyurethane. These dynamic new products with extreme durability offer long range economy to the end user and an opportunity for higher profits for both the manufacturer and dealer.

For specifications, uses, suggested formulations and merchandising ideas write



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# Five Reasons Why ASBESTINE® 325 Improves Products, Saves Money

ASBESTINE 325, the first "tailored" magnesium silicate of the famous ASBESTINE family, displays several advantages which can save you money and improve your products. That's why ASBESTINE 325 is popular as the sole functional pigment in many house paints, finds increased use in other finishes and is included in numerous coatings' research and development programs.

Here are five important reasons why you can expect ASBESTINE 325 to upgrade performance and lower costs in your current formulations or those you are developing.

- 1. Lowers Oil Demand—Proper selection of ore combined with "tailored" particle size distribution, i.e., oversize particles removed, intermediate sizes balanced and fines proportioned, accomplish this result.
- 2. Reduces Grinding Time—Is a stir-in grade. Absence of large particles and agglomerates, combined with its easy wetting characteristics, effect a Hegman of  $4-4\frac{1}{2}$  in minimum time with conventional mixing equipment.
- 3. Improves Leveling—Paints properly formulated with ASBESTINE 325 tend to exhibit improved sag resistance, easier brushability, and better leveling.
- 4. Aids Wetting—In oil, oleoresinous or water emulsion formulations ASBESTINE 325 wets easily. Because it wets readily, complete dispersion can be expected quickly and suspension maintained. Does not have after-wetting tendencies.
- 5. Lengthens Shelf Life—Tests show paints made with ASBESTINE 325 resist hard settling—even after prolonged storage. Fluid consistency is restored with quick agitation because of soft settling properties.

For Further information on, or samples of ASBESTINE 325, write today. Let us help you to improved surface coatings at lower cost.



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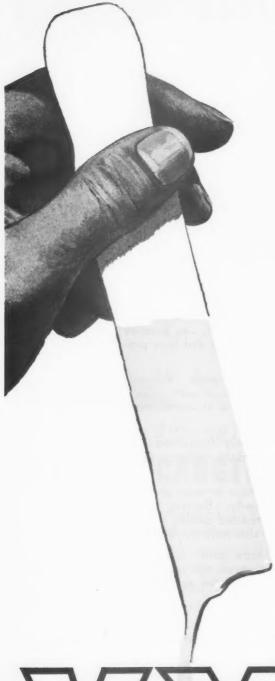
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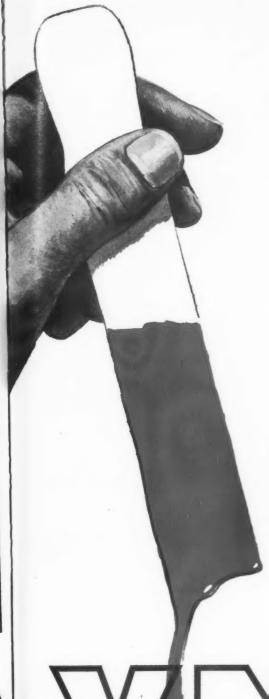


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# VYHD AND VMCC OFFER THESE IMPORTANT ADVANTAGES to you

Lower Formulating Costs Through Higher Solubility—VYHD and VMCC are more soluble in ketones and other vinyl resin solvents. You formulate using less of these premium—friced solvents per gallon.

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New Markets in Which to Sell Your Coatings—These resins can open a host of new markets for your coatings, many previously closed because of cost. See the advantages you can offer your customer.

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Lower Applied Film Costs Through Higher Solids Content
—Your customer can deposit heavier films per pass with your
high-solids coatings based on VYHD and VMCC. He'll save
many application dollars.

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A More Saleable Finished Product—He can provide more of his products with the beauty, toughness, flexibility and chemical resistance typical of vinyl coatings—and at lower cost.

Want more information? For samples and the latest technical literature on both these new resins, contact your Union Carbide Plastics technical representative. Or write: Dept. KU-103L, Union Carbide Plastics Company, Division of Union Carbide Corporation, 270 Park Avenue, New York 17, N.Y.

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These units have sturdy welded steel frames built for long, dependable service under rigorous operating conditions. The 3" diameter parallel-ground rollers are made of long-wearing chemical- and solvent-resistant Neoprene rubber. Heavy-duty motors and drives assure ample power.

FULL RANGE OF SIZES — Available with two or three rolls; single or multiple tiers; roll lengths from 16" to 72". Wide choice of optional equipment including cabinets, casters, automatic timers, tachometers, clutches and variable speed drives.

PROCESS EQUIPMENT DIVISION



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Sonic energy from the transducer "gun" at the top of the three for column destroys foam instantly. The second photo was taken .0 seconds and the third photo was taken .08 seconds of the first, destroying a column of foam in less than one second. See page 76.



PRODUCT RESEARCH



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Combine a keen and personal interest in your products and your processes with our sincere desire to be of help... and you have NATIONAL CAN'S — "Personal Service!"

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# NATIONAL CAN

CHICAGO . NEW YORK . SAN FRANCISCO ... PLANTS FROM COAST TO COAST

# A REPORTING SYSTEM for RAW MATERIAL SAMPLES

by Wayne R. Fuller\*

THE most potent factor in paint progress is the deluge of new raw materials and intermediates that are made available to paint chemists. This creates an opportunity for rapid advancement; but the opportunity is realized only in proportion as the new materials are tested and utilized to best advantage. If a paint laboratory is on the alert it obtains many samples of new materials for evaluation. After these samples are received questions regarding them arise in many ways:

(1) the supplier salesman calls and asks for a report,

(2) the supplier sends a form requesting a report by mail,

(3) the Purchasing Department wants a report,

(4) additional information is received and should be forwarded to the chemist who is testing the sample,

(5) for a variety of reasons the Technical Director may wish to obtain information regarding a sample or discuss its evaluation.

In a well staffed laboratory questions like these arise daily, perhaps several times a day. Unless there is a plan for keeping track of samples much time is wasted trying to determine who has them, when they were received and what has been done with them.

Raw material salesmen report that it is difficult to get definite reports on samples from some paint laboratories and that in numerous cases they never get a report of any kind. When given a detailed report within a reasonable period they are likely to express surprise and appreciation. A paint laboratory that is cooperative with raw material suppliers will receive whole hearted cooperation from them and this has no small value.

#### Checking New Materials

A substantial part of the time of a paint laboratory is devoted to the investigation of new raw materials, in the expectation or hope that they will help in the solution of problems.

In order to obtain a full return on this time, it is essential that the work be handled in an orderly manner. This requires a system to insure: (1) that samples with complete available information will reach the proper individuals without delay,

(2) that there will be a written report on each sample,

(3) that the report will be filed in such manner that it can be found easily, which may require cross-filing or cross-referencing.

Following is a description of a plan that has been in operation more than a year with gratifying results. Prior practice was to transmit samples to the laboratory with a typed memorandum and technical information.

The present system is built around the form that is reproduced



Resin chemist evaluates new intermediate for coating applications.

<sup>\*</sup>Research Consultant for Grand Rapids Corp.



Above: Chemist and sales representative discuss laboratory evaluation of new raw material in various paint applications. Below: Sample being examined visually for color and viscosity before it is sent to the laboratory for complete evaluation and testing.



herewith, reduced from standard letter size.

All samples and all correspondence and technical data regarding them are delivered to the office of the technical director, regardless of how they may be addressed. Each time a sample (or group of closely related samples from a single source) is sent to the laboratory it is accompanied by this form, filled out long hand in the office of the Technical Director, excepting Data Reported and Report. Following Description, notation is made of the classification for technical files. All relevant letters and technical information are attached to the form. At times this includes a typed memorandum that summarizes a conference with a sales or technical representative. The form has a conspicuous, distinctive color so that, when the testing is completed, failure to make a report immediately can hardly be from oversight. Since the tester has only to execute the date and the actual report lack of time is a poor excuse. When the Description space is inadequate it is extended to the space for Report. If the latter space is insufficient the report is carried over to the reverse side or attached on a separate sheet.

#### **Triplicate Copies**

When the form is initiated it is made out in triplicate; two copies on the colored form, one copy on plain white paper. The original goes with the sample. The colored carbon copy is filed in a folder along with the sheets on all other samples under test. These copies are filed alphabetically by name of supplier, which facilitates quick reference and follow-up. The third and white copy is filed in the general technical file under the proper classification as noted on the form. Thus any chemist or formulator who may consult the technical file will find a record of the sample. As a rule complete technical data are attached to this copy as well as the original, even when this involves duplicating letters and data sheets. No special effort is made to have technical data for the second colored copy.

Reports are made in long hand on the original copy only. A secretary types the report on both the colored carbon and the white carbon. The white copy goes back in the technical file. The colored carbon goes to the Purchasing Department. Depending on the nature of the sample, the original report may be cross-filed in the technical file, returned to the laboratory that made the report, circulated to other chemists or simply discarded.

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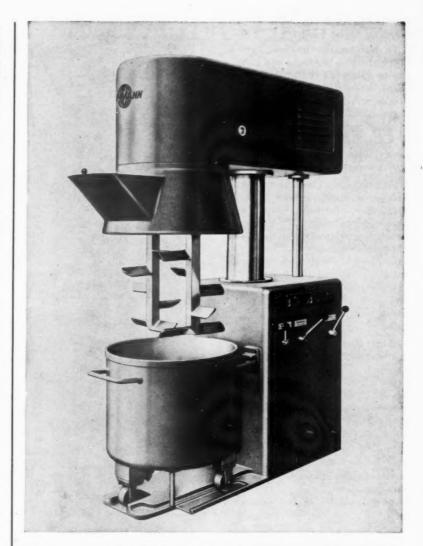
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In the operation of this plan only one weakness has been evident and it reflects human fallibility rather than a deficiency in the plan. Although the record on reporting has been greatly improved, there has been some need for follow-up. Further familiarity with the plan should reduce this to a minimum.

Since it takes time to carry out systems, one must recognize the possibility of too many as well as too few. The only sound ground for the adoption of a more complicated procedure is to solve an important, persistent problem. The plan described is not needed or justified for a laboratory that develops a rather narrow or simple line of products. It has proved clearly advantageous for a laboratory that is responsible for a wide range of industrial and trade sales paints, including the development of resins of several basic types. For each other laboratory the value of the plan must be determined by consideration of its particular set of conditions.

A similar problem is presented by the experimental resins and other vehicles that are developed by the resin laboratory of a paint manufacturer. Following screening tests by the resin laboratory these products must be thoroughly evaluated by the groups that use them in the formulation of finished products. Obviously there should be an orderly procedure for the transmission of samples and for reporting on them.

The form that has been described has been found well suited to this purpose, preferably with the paper of a different color. The reports by formulators are made to the resin laboratory. The Technical Director receives copies of the transmission form and of the reports to the resin laboratory, so that he is kept informed on the progress of resin developments.



## THE LEHMANN PLANETARY MIXER

### improves output and reduces cost

No engineering detail has been overlooked to make this modern Mixing and Kneading Machine the most efficient and economical in its field. For the intensive and uniform mixing of highly fluid, viscous and pasty materials it is unsurpassed.

The planetary action is uniquely effective. Two mixing spindles equipped with helically arranged vanes move along the tank wall while rotating at high speed around their own axes. The mixing mechanism is raised and lowered automatically.

Swivel, tilting, run-out or stationary tanks are provided in capacities from 1 to 350 gallons. The use of several tanks permits almost continuous production. The machine is available in several types and power specifications. Stainless steel or other metals are obtainable if required. The unit can be cleaned quickly when frequent changes are desired in shade or type of product processed. Maintenance costs are unusually low.

Write or telephone for prices and further information.



### J.M.LEHMANN COMPANY, Inc.

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#### Sonic Waves Used to Fight Foam

Foam formation has long been a big production headache and handicap to industries that manufacture soaps, shampoos, beer, wine, soft drinks, mil, drugs, paper petroleum, chemicals latex paint, and hundreds of other products.

A new foam fighting system has been developed that employs sonic sound waves to destroy foam.

At a recent luncheon symposium, Stanley R. Rich, president of Teknika, Inc., Hartford, Conn., who invented the sound wave "gun", demonstrated the system to leading chemical engineers and industry executives. A seven foot column of foam was created and destroyed in .8 seconds by sound waves, reducing the suds to their original liquid state almost instantly. (See picture.)

The Teknika system shoots sound waves from a new type of sonic transducer "gun." The high intensity sonic energy actually explodes the undesirable foam within a special resonant chamber that is installed in the production pipelines wherever the foam is formed.

Purely by the physical action of the sound, the system destroys foam at rates at fast as 1,000 cubic feet per minute, which is typical of some of the more serious foamgenerating problems. Sound can be described as pressure variation. Most sound, at ordinary listening level, causes only a very small increase and decrease of normal or atmoshperic pressure.

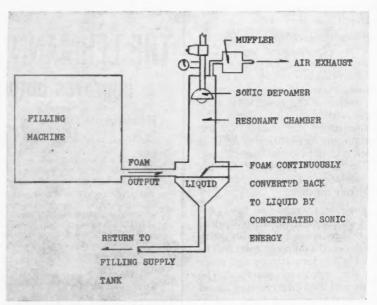
The defoamer produces extremely intense sound, generating such immense pressure variation that an actual near-vacuum is created during a portion of each cycle. Thus foam bubbles are subject to pressures that alternate 12,000 times per second between more than 30 p.s.i. and close to vacuum.

The system will eventually save money for the various industries in the saving of time wasted in settling foam, elimination of antidefomants chemicals, centrifuges and foam-settling tanks.

Although the new system has not yet been employed by the paint industry, it is conceiveable that it would be highly useful, especially in application to latex paints.



A seven foot column of foam is destroyed in .8 seconds by sonic energy from the transducer "gun" at top of tube. The gun produces extremely intense sound, generating such immense pressure variation that an actual near-vacuum is created during a portion of the cycle.



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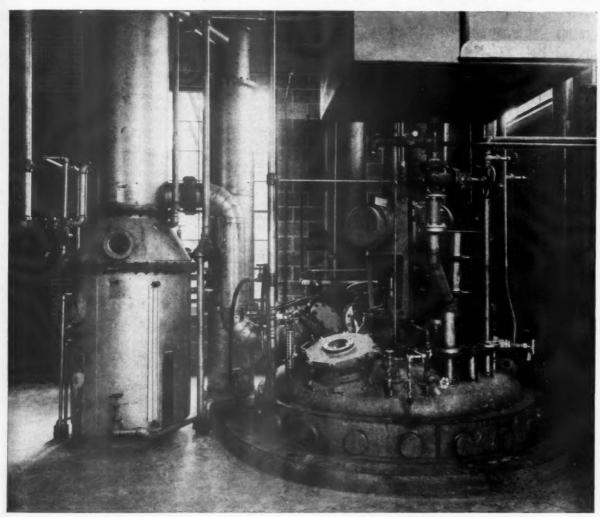
PA

Diagram shows a continuous defoaming system for filling machines.

# when Lilly Varnish Company talks QUALITY...

...about resin kettles

# they talk BRIGHTON



From Indianapolis, Lilly Varnish Company has established a nation-wide reputation for products of incomparable quality. Like all great companies it has the capacity to recognize quality in other things. For example, Brighton reactor units are furnished complete and ready for installation. Only connections to existing electric power and piping are needed . . . there's no need for expensive "extras" after they are received. Any company engaged in the production of paints or varnishs will, after a short time, appreciate the cost advantages of Brighton reactors, as well as the very lowest maintenance as compared to any other unit. As

a matter of fact, Brighton today . . . as always . . . makes the finest equipment, and enjoys an excellent reputation

for quality throughout the varnish and allied industries. A new Bulletin, now available, tells all about it. Write for your copy today to:





BRIGHTON CORP.

METALSMITHS · EST. 1914

820 STATE AVENUE . CINCINNATI 4, OHIO



#### BENZOIC ACID, TECHNICAL... new way to make better alkyd resins—at lower cost

Benzoic acid now has new potential as a modifier of alkyd resins, since the price has been reduced to 20 cents a pound. With pentaerythritol and other higher polyalcohols it produces coatings with better gloss and durability than similar films made with up to 40% excess glycerin. Try holding excess alcohol to 5% in alkyd formulations by replacing up to 10% of the phthalic anhydride with benzoic acid.

Benzoic acid can partially replace higher-cost pelargonic and lauric (from coconut oil) acids in 40% and less oil length alkyds—with noticeable improvement in the gloss and durability of the enamel. At its new low price, 66 pounds of benzoic acid can replace 100 pounds of paratertiary-butyl benzoic acid to give equal film performance.

For trade-sales paints consider benzoic acid for water-soluble alkyds; emulsion alkyds; and alkyds for blending with polyvinyl acetate, styrene-butadiene, and acrylics.

No profit-conscious alkyd resin manufacturer can ignore the potential savings and improved coatings made possible by benzoic acid.



# SANTICIZER® 160 . . . "flexibilizes" acrylic coatings and safeguards gloss

Acrylic resins put high-gloss "sales appeal" in coatings—though some-times the gloss fades and the flexibility just isn't good enough. The resins stubbornly refuse to respond to most plasticizers. But there's one plasticizer acrylics really "go" for: Santicizer 160. It's highly compatible up to at least 35% with acrylic resins—and a coating with 28 PHR actually retains a better gloss after 12 months of Florida exposure than an unplasticized formulation! Acrylic coatings formulated with Santicizer 160 have outstanding resistance to water spotting, too, plus improved flow and leveling. Their sheen and durability have been proved over the years. Want to make a flexible, high-quality, fast-drying acrylic finish? Monsanto can guide you in formulating with Santicizer 160—the most compatible plasticizer for acrylic resins.



#### SANTOBRITE®... the penny AR and-a-half per gallon insuranceate against mold and fungi cu

Shelf life and storage in warm en in vironments make protection agains commicroorganism attack imperative ima a manufacturer wants to insure the acquality of his brand. Organic manufacturer wants to insure the interest of the committee of the c

Penta (oil-soluble pentachlorophe in nol) and Santobrite (its water on soluble sodium salt) kill the guality-destroying microorganism out in low concentrations. Cost? As littlend as 1½ cents per gallon! Water-solubtres Santobrite is ideal for preservingor water-base casein, rubber latex, an multiple of the construction of th

heir

### Monsanto task force chemicals

MISSION:

# CHEMICAL PATHS TO NEW COATINGS

Paint chemistry breaks the "profit of squeeze"! New ways have been found ven to make new film formers—different biolo tougher, more economical than any found thing before. They have to be. To omp day's needs demand paints, lacquers account and special coatings with superiorer, contemical and weather resistance in prestronger adhesion to a wider variety of "b



#### penny AROCLOR®... improves chlorinsuranceated rubber and epoxy coatings. cuts cost

varm en In swimming-pool paints, industrial n agains coatings, and marine and trafficerative imarking paints—the Aroclor liquids erative imarking paints—the Aroclor liquids usure than resins (12 to select from) impart anic may avariety of performance improve—whethe ments. In chlorinated-rubber paints, reolventhe presence of an Aroclor resin inptible treases resistance to water, acid, lt can be trength—imparts greater weather ad color resistance. Makes the coatings flame-teardant, too!

Aroclor plasticizers are compatible hlorophe with epoxy resins. The *liquid* Aroclor s water ompounds give epoxies a high dell thes ree of flexibility—the *resinous* compared to the resinous companion. organism ounds act as reinforcing resin ex-? As littlenders. The addition of an Aroclor er-solub reatly retards the burning rate of reservingoxy compositions, and, when for-atex, an unlated with a small amount of s. It cantimony oxide, produces nonacts, todurning formulations!

pigmen dissolved major value of Aroclor compounds solvents their complete inertness. Alkyds, converte olyesters, rosin esters—in contact ddition with cement—all saponify, thus ddition to sing some chemical resistance; dium io thorinated paraffin under weatherigher cong conditions loses chlorine and beamount omes subject to attack. But the other pair. ake pain purposes are immune to chemical cant. Thange. Aroclor additions to coatings invariably improve their perormance—and frequently reduce heir cost per gallon, as well.



#### DIBUTYL MALEATE, DIBUTYL FUMARATE...permanently preplasticize polyvinyl acetate coatings

DBM and DBF, highly reactive monomers, readily copolymerize with vinyl acetate—give desired flexibility that is permanent. The internally-plasticized polyvinyl acetate coating is not subject to extraction or volatilization; and such coatings show a marked improvement in general properties over the best postplasticized formulation. A polyvinyl acetate latex paint formulated with 20% DBM or DBF has sufficient flexibility for good low-temperature performance.

In addition, the pigment-binding power, weather resistance, and abrasion resistance are greatly improved. The coatings dry fast and-since the film is internally plasticized-problems of migration are virtually eliminated. The DBM and DBF esters are the most efficient comonomers on a price/performance basis. Data show savings of 1¢/lb. on resin solids when compared to other monomers for this use.

DBM and DBF also copolymerize with vinyl chloride, acrylics, styrenebutadiene, and other resins and monomers. Blends of these modified systems with alkyds can be expected to produce low-cost, high-performance, alkyd-extended resin systems.







WITH

#### MODAFLOW®... new additive improves leveling, flow-on, eliminates "pinholing"

Modaflow is one of those special materials that work wonders even with small "doses." It's so new in the coatings field that its span of uses is just beginning to define itself. Basically, Modaflow acts on the surface tension of organic liquids. Added in the range of only 0.10 to 2.0% Modaflow promotes leveling and spreading. It completely eliminates bubbles and foam entrapment in many acid and neutral organic coatings systems.

Modaflow has such a unique action that it should improve the film uniformity and the application characteristics of any flow-on, dip, or rollercoat formulation-whether the base resin is alkyd, melamine, phenolic, polyester, or epoxy. Modaflow appears to be water and pH sensitive. However, it will tolerate up to 2% water in the system, and the concentration needed will vary with the resin and with degree of acidity. In evaluating Modaflow in any specific coating formulation, a wide range of concentration must be tried "stepwise," since the modification usually takes place in a certain critical concentration range, which in some coatings is quite low; in others, much higher. In any case, just a little Modaflow does a lot.

"profitof substrates; increased flexibility: n found ven better resistance to mildew and ifferent, piological attack.

an any Monsanto offers a whole task force of be. To compounds that can help you make suracquers ace coatings perform better, process easuperiorer, cost less to manufacture. Check the stance ix profit-stretchers above. Use them variety "build" new products of your own.

For more details, use this handy coupon

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Please send more information about:

☐ Benzoic Acid ☐ Aroclor

☐ DBM and DBF Santicizer 160

Santobrite ■ Modaflow



#### NEW DEVELOPMENTS

#### Cargill Introduces New System Mixing Linseed Oil & Water

Cargill, Incorporated introduced its Formula 1308 which joins water and vacuum-bodied linseed oil into a potential one-coat system.

The product has been evaluated on exposure panels and test houses in different parts of the country for more than 2 years, and offers several advantages which include:

1. A base of pure, highly polymerized linseed oil.

2. Adhesion to a complete range

of prepainted surfaces "from the chalkiest to the glossiest".

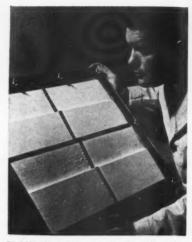
3. Creation of a potential onecoat system for repaint.

4. A quick-drying two-coat system—such as needed over new, non-staining wood or in a major color change—that dries tack free and is recoatable within 30 to 60 minutes.

An emulsion compatible with zinc oxide and high in mildew resistance.

6. A finished paint, easily applied, which allows brush clean-up with soap and water.

The formula overcame the problems in exterior exposure tests of adhesion associated with latex paints



BLISTER BOX text in Cargill paint laboratories shows chemist examining effects of heat and moisture on a variety of exterior coatings. Although no blisters formed on self-primed (prime containing .5 pounds of zinc oxide) Formula 1308 paint. (upper right) or on a self-primed (prime containing 1.3 pounds zinc oxide) 1308 film (upper left) heavy blistering occurred on a self-primed conventional linseed oil paint (lower left), rosin "bleeding" was found on formula madefrom commercial latex (l. rightt).

when applied over chalky surfaces.

The formula 1308 paints are blister resistant on new wood, even when zinc oxide is added. However, it was emphasized that when 1308 or any coating applied over an already blistered condition, the problem will continue.

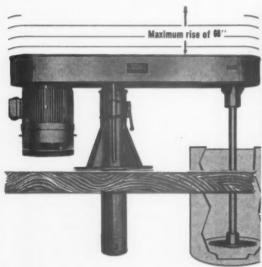
After 30 months of test fence exposure, 1308 paints containing zinc oxide had excellent durability, showed less chalk, mildew and dirt collection and remained whiter than conventional oil house paints.

#### Linde Produces Stable One-Can Epoxy Resin

Stable, one-can epoxy resin systems that cure at room temperature are now available with the introduction of a new method that allows the catalyst or hardener to be intimately and uniformly premixed with the resin and, yet, remain completely isolated from it until needed.

Linde Company, Division of Union Carbide Corporation, has developed these new types of latent hardeners and catalysts which are called Chemical-Loaded Molecular Sieves.

In the new method the active hardener is adsorbed and held within the pore structure of Molecular Sieve adsorbents. Since the larger





Typical "through-the-floor" installation in plant of leading national manufacturer. Inset photo and diagram show how Cowles unit adapts to solve problem. Bridge rise by hydraulic lift is \$6" to overall height of 174 %". Swing of bridge and impeller is 270°. One or multiple mixing tanks may be used—as batch or continuously, Available in 40 to 75 H.P. sizes.

# NEW COWLES "through-the-floor" DESIGN SOLVES MANY MIXING PROBLEMS

...in some cases may be the only solution!

Sometimes processing requirements, plant arrangements and space limitations seem to conspire against efficient, economical production. Originally designed to meet a special situation, this new Cowles model has been useful in so many cases of this kind that it is now in our regular line.

Where space can be made available on upper floors, balconies, walk-ways, etc., it may be the answer—may even eliminate the need for major plant expansion!

The vertical set-up often saves vitally needed floor space. Gravity flow may be used to great advantage. Production can be piped direct to lower areas for further processing or packaging, since many products can be completed on the Cowles without the necessity for milling.

All the advantages of Cowles Dissolvers are retained. Ultimate dispersion is attained in minimum space at minimum cost with the patented impeller "teeth that make the BIG difference." The exclusive MPD\* (Maximum Power Delivery) transmission system delivers plenty of power even at slowest speeds. Cleaning between batches is simple and easy.

Your inquiry is invited. Write us today on your company letterhead. No obligation.

COWLES

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epoxy resin cannot enter the pores, it is completely isolated from the system. At the proper time, the "caged" hardener can be released by the application of heat or the introduction of a displacing agent. Moisture from the atmosphere can often be used as such as agent. Therefore, a prolonged pot life and shelf life is obtained while maintaining the cure rates normally associated with the pure hardener. For example:

1. An epoxy coating formulation which has been can-stable for months (i.e. no increase in viscosity) cures at room temperature in less than 8 hours when cast in a 3-mil film and exposed to the atmosphere.

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2. An adhesive recipe which has been can-stable for months cures in 30 minutes at 220°F and faster at higher temperatures.



In a matter of minutes, the epoxy resin containing a liquid polyamine curing agent has jelled in the jar on the right. The equivalent epoxy formulation on the left containing polyamine-loaded Molecular Sieves is still fluid after months on the shelf.

The choice of Chemical-Loaded Molecular Sieve product will depend upon the cure conditions required, or available, for the specific application and the shelf life desired. There are three basic types of Chemical-Loaded Molecular Sieve products available for epoxy formulations: simple polyamineloaded hardeners, modified hardeners and tertiary amine catalysts.

The simple polyamine-loaded Molecular Sieve will provide a oneyear shelf life and cure at room temperature if a displacing agent such as water is present during cure. This type of Chemical-Loaded Molecular Sieve system would be applicable in thin-coating or adhesive applications where atmospheric and substrate moisture is present.

If the coating, adhesive, or casting can be heated to 250-350°F., a modified polyamine-loaded Molecular Sieve hardener can be used. A special modification is required if the polyamine is to be released from the Molecular Sieve by heat alone.

The third type of epoxies contains tertiary amine catalysts. Tertiary amines, like triethylamine, can be released either thermally or by a displacement, or both.

The crosslinking of an epoxy resin during cure is a strongly exothermic reaction, particularly when a polyamine hardener is used. Temperatures of 400-500°F, can be reached in one-pound batches. The reaction exotherm has been found to be much lower when the polyamine is added as a Chemical-Loaded Molecular Sieve. lower temperature thus maintained during cure is important in applications where epoxy resins are used to encapsulate delicate, temperature-sensitive electronic parts, or-since the exotherm is greater in large masses-where the resins are used to cast large components.



#### **Weathering Qualities of Paints** can be pre-determined with speed and accuracy in the R-OME1

The natural weathering effect of sunlight, moisture, thermal shock and rain is reproduced on a highly accelerated basis in the Weather-Ometer. The cycle to be used is controlled by the Cycle Meter which automatically regulates the length of the exposure to light and moisture under controlled conditions of temperature. Available with automatic control of relative humidity permitting exposures under conditions simulating the formation of dew.

Results are positive and dependable and any test program can be duplicated or repeated at any time

A few of many users of **Atlas Weather-Ometers:** 

Radiant Color Co National Lead Co. Ford Motor Company Harrison Paint & Varnish Co. John Lucas & Co., Inc.

Rust-Oleum Corp.

Reardon Co.

De Soto Chemical Coatings Inc. Pratt & Lambert Inc. Pittsburgh Plate Glass Co. General Electric Co. E. I. DuPont de Nemours & Co., inc. Glidden Co. Benjamin Moore & Co. Cook Paint & Varnish Co. Sherwin-Williams Co.

ATLAS ELECTRIC DEVICES CO. 4114 N. Ravenswood Ave., Chicago 13, Illinois U.S.A. 6 ways
to meet
the exact requirements
of your
exterior paint formulations

# AZO leaded ZINC OXIDES

ТҮРЕ		AZO 50-L	AZO 35-L	AZO 35-M	AZO 18-L	AZO 18-L-S	AZO 12-L
		Cofumed	Cofumed	Blended and Acicular	Cofumed and High Basicity	Blended and Acicular	Cofumed
Consistency in	Paint	Low	Low	Medium	Low	Medium Low	Low
Specific Gravit	У.	5.95	5.85	5.85	5.75	5.75	5.70
Weight Per Soli	id Gallon (Pounds)	49.56	48.73	48.73	47.90	47.90	47.48
One Pound Bul	lks (Gallons)	0.02018	0.02052	0.02052	0.02088	0.02088	0.02106
Per cent Zinc C	Oxide (Approximate)	50	65	65	82	82	88
Per cent PbSO4-	-PbO (Approximate)	50	35	35	18	18	12
Per cent Basicit Lead Oxide-	y (Expressed as PbO)	12-14	6.5-8.5	6.0-7.5	7-7.5	6-7	0.5-1.0
£	ASTM	D80-41	D80-41	D80-41	D80-41	D80-41	D80-41
Specifications	Federal		TT-Z-321a	TT-Z-321a			

The properties you want most in your exterior paints can begin right here...with the AZO leaded zinc oxides you need for durability and mildew resistance in your primers and top coats.

AZO cofumed leaded zinc oxides have excellent mixing and dispersion qualities and produce the lowest consistency in paint. AZO blended type leaded zinc oxides generally give higher consistency and improve color. Both types have uniform consistency within grades—help minimize mixing problems in your plant.

To meet your exact requirements, specify AZO brand zinc oxides: leaded, lead-free . . . and the exclusive de-aerated AZODOX form

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# NE EQUIPMENT AND MATERIA

This section is intended to keep our readers informed of new materials and equipment. While every effort is made to include only reputable products, their presence here does not constitute an official endorsement.

#### LATEX BINDER Vinyl Acetate—Acrylic

The ever expanding do-it-your-self market has developed a new dimension in the paint market. The demand for products which are easier to apply, more washable and durable also has grown. UCAR Pigment Binder 180 is one of these products. It is a small particle size vinyl acetate-acrylate copolymer combining broad formulating latitudes with good mechanical stability and water resistance. It also offers the following properties:

- 1. Fine particle size 0.1 to 0.2 microns.
- 2. High pigment binding capacity.
- 3. Broad formulating tolerance.
- 4. Excellent retention of flexibility.
- 5. Excellent stability to borax and other soluble salts.

41

Inherent mechanical and chemical stability of UCAR 180 gives the formulator of interior and exterior paints or industrial coatings the ability to employ a wide range of ingredients and processing methods. Coatings based on this latex are applicable by brush spray, dip, roller, etc. Union Carbide Chemicals Company, Dept. PVP, 270 Park Ave., New York 17, N. Y.

#### "TRAFFIC YELLOW" For Safety Paint

A new color, "Traffic Yellow", has been added to the line of HI-VIZ Industrial Safety Paint. It is the fluorescent counterpart of non-fluorescent "Federal Yellow".

HI-VIZ Industrial Safety Paints also are available in Red-Orange, Yellow-Orange, Red, Pink, Cerise-Red, Gold-Yellow, Lemon-Yellow and Green.

The high visibility and brilliance of the HI-VIZ line can be highly utilized in municipal uses on fire hydrants, alarm boxes, police, fire and other emergency vehicles, traffic control signs, highway strippings, barricades, radiation protection shelters, etc. The paints have lasting weatherability, maintain their color for periods up to 21 months or more, depending on method of application and geographical location. Paints can be applied by brush, roller or spray equipment and are also available to aerosol containers. A detailed brochure may be obtained from Lawter Chemicals, Inc., Dept. PVP, 3550 Touhy Ave., Chicago 45. Illinois.



ERTEL ENGINEERING

#### FILLING MACHINE Fully Automatic

The Fully Automatic Filling Machines, for either vacuum or gravity fill, are electronically controlled and containers are automatically handled throughout intake, filling, and discharge cycles. The filling time is adjustable as to containersize and viscosity of product. It also has a "fail-safe" device which protects against misalignment, breakage and jam-ups.

Ertel Engineering Corporation, Dept. PVP, Kingston, New York.

#### ANTI-FOAMING AGENT Water-White

Recently developed, the Ex-Foam 333 does not contain silicones, will not separate and is almost water-white. The new agent has a low specific gravity and high bulking value. The cost is low.

Troy Chemical Company, Dept. PVP, 338 Wilson Avenue, Newark 5, N. J.

#### 'EVERFLEX CA' Color Compatible

Just recently introduced is a new vinyl acetate copolymer emulsion with a native colorant affinity which produces maximum color development. The emulsion which is especially formulated for paints after two years of research, is called Everflex CA. The emulsion is compatible with all "universal" and water base tint color systems. By imparting a high degree of pigment compatibility to the polymer particle, an emulsion has been produced which is a radical departure from previous vehicles. Contrary to conventional emulsions, Everflex CA formulations excell in water resistance and adhesion. In addition to its color properties, Everflex CA is outstanding in its freeze-thaw resistance, that is, the polymer and paints made from it can be shipped in winter with a minimum risk. The emulsion has an extremely low odor level and high borax compatibility. It shows slow pH drift with resultant of a minimum of yellowing and gassing. high molecular weight provides maximum durability and tensile strength of the paint film, increasing scrubbability and resistance to weathering factors. The small particle size guarantees high pigment binding power. Dewey and Almy Chemical Division/W. R. Grace & Co., Dept. PVP, Cambridge 40, Massachusetts.

# N E W MATERIALS — EQUIPMENT

S AND A PRODUCTS

#### VISCOSITY TESTER Precision Instrument

The Viscotester is portable, direct-reading, self-contained instrument for measuring the viscosity of liquids and pastes in the field, laboratory and plant testing. It has a stainless-steel rotor, coupled to the underside which is immersed into the test sample and power switch energized. The rotor turns the direct-reading indicator-pointer so that the viscosity reading in

poises can be read on the logarithmically-calibrated scale. It has a viscosity range of 3-150 poises; 100-4000 poises, with and accuracy of ±5 per cent full-scale range.

S and A Products Co., Dept. PVP, 120 East 19th Street, Brooklyn 26, N. Y.

#### STYRENE-BUTADIENE LATEX For Paint Manufacturers

A new latex has been developed and is called "Dow Latex 300". The product was designed to have the main advantage for paint manufacturers who could formulate it with synthetic thickeners and get increased uniformity, stability and hiding in paint at less production cost.

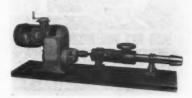
Dow Chemical Company, Dept. PVP, Midland, Michigan.

#### PIGMENT SUSPENSION Paints and Printing Inks

Suspension of pigments in paint and printing inks may be aided by addition of finely divided silica with an ampholytic surface active agent.

Just 0.1 percent addition of Armeen Z along with 0.5 percent finely divided silica will provide the same anti-settling effect as the use of 2 percent silica alone.

Armour Industrial Chemical Company, Dept. PVP, Chicago 90, Illinois.



FERNHOLTZ MFG.

#### ALL-PURPOSE PUMP Tubular Construction

An all-purpose pump, available in nine sizes ranging in capacity from 1 to 500 GPM, has recently been made available. It has a tubular construction which eliminates "one more casting", and which makes the pump lighter and easier to service. The pump is said to pump "anything that flows"—from acids, chemicals, petroleum products to potato salad.

Fernholtz Manufacturing Company, Dept. PVP, 8466 Melrose Place, Los Angeles 46, Calif.

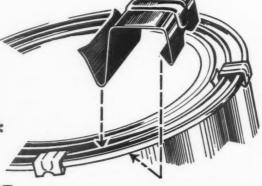
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# Seal Cans Fast

FREUND TRIPLE-GRIP

# Can Clips

\* Exceed Post Office Requirements for Parcel Post Shipment



If you ship in friction top cans--it will pay you to seal the lids with Freund Triple-Grip Can Clips. Once applied--they stay put. And anyone can quickly and easily apply them--no skill or experience required.

#### SEND FOR SAMPLES

For convincing proof--you're invited to try Freund Triple-Grip Can Clips and see for yourself. Samples, simple instructions, and low quantity prices--yours for the asking. Use your letterhead or handy coupon.

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Chicago 20, Illinois
Without obligating us in any way-send us samples of
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### N E W MATERIALS — EQUIPMENT

#### LATTING AGENT Last Dispersing

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Super Fine Super Floss, a diatomite flatting agent for paints, is a white diatomaceous silica for use in modern, high speed dispersion equipment. It requires no milling or grinding; It has a carefully controlled particle size which sets new standards for film smoothness and assures maximum gloss reduction where enamel-like smoothness is required according to the manufacture. It has a 7.5 lbs. per cu ft loose weight, with an oil absorption of 130 lbs per 100 gals, a free moisture of 1.0 per cent, bulking values of 19.2 lbs per gal (0.052 gals per lb).

Johns-Manville, Dept. PVP, 22 East 40th St., New York 16, N. Y.

#### EPOXY DILUENT Reduces Viscosity

Agent AT-534, a epoxy diluent, is a high-boiling, odorless liquid which reacts readily with epoxyduring agent admixtures without any appreciable effect on the rate of cure or gel. It has a high margin of safety and permits long storage under normal conditions. Acetylene Chemicals Department of the Antara Chemicals Division, General Aniline & Film Corporation, Dept. PVP, 435 Hudson St., New York 14, N. Y.



THERRIS CONSOLIDATED

#### ALARM SYSTEM For Liquid Flow Control

Primarily designed for use on flow control, this unit is a unique device for sensing slow down in pressure lines. Any failure in supply immediate actuates an alarm. All contact surfaces are of stainless steel, the internal diaphragm is of neophrene. Therriss-Consolidated Industries, Dept. PVP, 22 Wooster St., New York 13, N. Y.

#### HYDROCARBON RESIN Heat-Reactive

Piccodiene 2215, a highly aromatic polymer with unsaturated double bonds possessing light color and excellent solubility, is used in the preparation of fast-drying varnishes, enamels, concrete curing compounds, printing inks, and adhesives. It is furnished in a special rubber grade, which is stable to oxidation and high temperatures. It is available as a solid resin, flaked in multiwall bags, or as a solution in mineral spirits.

Pennsylvania Industrial Chemical Corporation, Dept. PVP, 120 State St., Clairton, Pa. VINYL EMULSION For Exterior Use

Resin D-886, a vinyl emulsion which provides extremely tough, flexible films possessing a balance of properties particularly suited to paper and textile applications, is now available. Cast films of this product are readily cured by heat and are highly resistant to water and to organic solvents. The emulsion is also used as an exterior finish on aluminum, wood sidings.

Shawinigan Resins Corporation, Dept. PVP, Springfield, Massachusetts.





Complete copies of any patents or trade-mark registration reported below may be obtained by sending 50c for each copy desired (to foreign countries \$1.00 per copy) to the publisher.

#### **Aqueous Coating**

U. S. Patent 2,994,677. Arthur F. Bohnert, Chicago, and William A. Vanick, Hinsdale, Ill., assignors to Enterprise Paint Manufacturing Company, Chicago, Ill., a corporation of Illinois.

Paper coated with a baked-on, clear transparent, continuous film deposited from a water emulsion of polymeric material from the group consisting of (a) styrenebutadiene copolymer and (b) mixture of polystyrene and styrenebutadiene copolymer, wherein the styrene moieties of said polymeric material comprise the major portion thereof and the butadiene moieties comprise the minor portion thereof, said film further containing an amount between about .625% and 3.32% by weight of polyethylene uniformly distributed through said polymeric material sufficient to impart non-blocking characteristics to the film without interrupting the continuity of the film and its clear transparent character, said film strongly adhering to the surface of the paper but not deeply impregnating the paper, and said filmed paper possessing heat-insulating as well as non-blocking characteristics and improved resistance to penetration, staining and disintegration of the paper by hot and cold beverages such as coffee, tea, milk, cocoa and fruit juices, said film further being essentially free of taste and odor while tending to mask the taste of the paper over which it is coated.

#### **Bituminous Compositions**

U. S. Patent 2,996,398. Clarence F. Huber, Mount Healthy, and Paul F. Thompson, Deer Park, Ohio, assignors to The Cincinnati Milling Machine Company, Cincinnati, Ohio, a corporation of Ohio.

A bituminous composition essentially composed of a bituminous material and from 0.1 to 5% by weight of a thermally stable bond-improving agent selected from the group consisting of amides of N,N-di(aminoalkyl)-N-alkyl amines and salts of such amides, the amide-forming acids being organic carboxylic acids having from 2 to 20 carbon atoms; and the salt-forming acids, when present, and at least one of the amide-forming acids being organic carboxylic acids having from 10 to 20 carbon atoms.

#### Reflex Reflective Coating Composition

U. S. Patent 2,997,403. Charles E. Searight, Jackson, Miss., assignor to Cataphote Corporation, Toledo, Ohio, a corporation of Ohio.

À sprayable composition for the production of a permanent, reflex reflective coating which consists essentially of a clear, cellulose derivative lacquer, a solvent suitable tor said lacquer, and a plurality of small glass beads uniformly dispersed in said lacquer, said beads having a refractive index from about 1.90 to about 1.95, and a density not greater than about 4.25 grams per cubic centimeter, 70 percent to 90 percent of said beads having diameters between about 0.0017 and about 0.0024 inch and all of said beads having diameters less about 0.0067 inch, and said beads

being present in the dispersion to the extent of from about 25 volumes to about 40 volumes with from about 75 volumes to about 60 volumes of the acquer.

#### Water-Repellent Masonry Coating

U. S. Patent 3,006,875. Leo Liberthson, New York, N. Y., and Henry Lipkind, Nutley, N. J., assignors to Sonneborn Chemical and Refining Corporation, a corporation of Delaware.

A waterproof masonry coating material comprising an oleo-resinous base paint containing a pigment, a drying oil and a synthetic resin and additionally containing as filler about 25-35% by weight of an inert material selected from the group consisting of silica and the silicates of calcium, aluminum and mag-



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nesium having a particle size, of from 30-80 mesh and coated with an organopolysiloxane selected from the group consisting of lower alkyl and lower alkyl aryl polysiloxanes, the alkyl radical of said group members containing up to 2 carbon atoms.

#### **Modified Shellac Coatings**

U. S. Patent 2,991,262. Herbert Norris Johnston, Columbus, Ohio, assignor, by mesne assignments, to American Bleached Shellac Manufacturers Association, Inc., New York, N. Y., a corporation of New York.

A modified shellac wash primer characterized by its ability to provide a base coating for painting thereover, the base coating having improved resistance to water spotting over that of unmodified

shellac and further characterized by good adhesion to metals and glass, the primer comprising: a reaction product of mixing a solution of shellac in an organic solvent with a solution of phosphoric acid and chromium trioxide in the proportions for the total amount of shellac, phosphoric acid, and chromium trioxide of about 1 to 36 percent by weight phosphoric acid, 0.5 to 25 percent by weight chromium trioxide, and the balance shellac.

#### Strippable Coatings

U.S. Patent 3,000,748. Walter L. Clark, Ramsey, N. J., assignor to American Cyanamid Company, New York, N. Y., a corporation of Maine.

A transparent coating composition consisting essentially of from about 40

to about 85 parts by weight of a glyceride selected from the group consisting of (a) glycerides represented by the formula

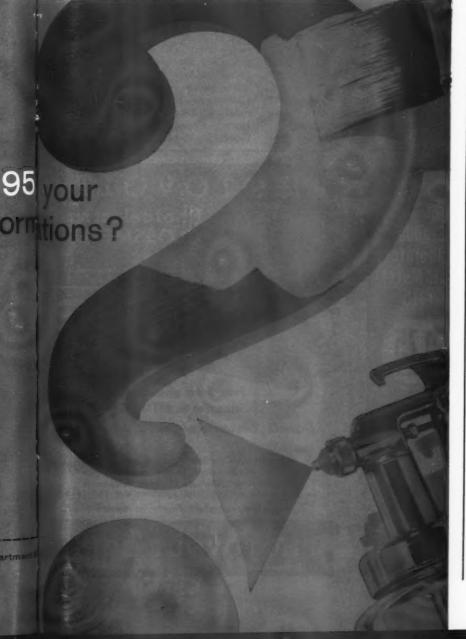
$$\begin{array}{c} R_1 - O - CH_2 - CH - CH_2 - O - R_3 \\ | \\ OR_2 \end{array}$$

wherein R1 and R2 are selected from the group consisting of hydrogen and the acyl radicals of aliphatic monobasic and polybasic acids of from one to about six carbon atoms, not more than one of R<sub>1</sub> and R<sub>2</sub> being hydrogen, and R<sub>3</sub> is the acyl radical of an aliphatic, long-chain fatty acid having one unsaturated double bond and a chain length of from about ten to about 30 carbon atoms, and (b) mixtures of such glycerides in which the average unsaturated double bond content of the long-chain fatty acids is from about 0.5 to about 1.5; and from about 15 to about 60 parts by weight of a cellulose ester component having a hydroxyl content of from about 0.5% to about 2.5%, an acetyl content of from about 6% to about 32%, and from about 15% to about 50% of an aliphatic acyl radical of from three to about eighteen carbon atoms, said ester having a viscosity of from about 0.25 to about 35 seconds and being present in amount to comprise from about 15 to about 50 weight percent of the composition.

#### Method of Selectively Coating Surfaces.

U. S. Patent 3,002,848. Harold A. Clark, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich., a corporation of Michigan.

A method of selectively coating a solid surface with an organopolysiloxane resin which comprises (1) applying a coating of uncured siloxane resin to said surface, (2) placing a coating having an acid number of at least 1 and consisting essentially of a non-volatile carboxylic acid, against that portion of the siloxane resin coating which it is desired to remove from said surface, (3) heating the coated surface at a temperature below the decomposition temperature of the carboxylic acid to cure that portion of the siloxane resin coating not in contact with the acid coating and (4) removing the uncured siloxane resin and any adhering carboxylic acid coating from said surface with an alcohol solvent whereby the cured silicone coating remains on the desired parts of said surface, said siloxane resin consisting essentially of a monovalent hydrocarbon substituted polysiloxane in which there is an average of from 1 to 1.7 monovalent hydrocarbon groups per silicon, said siloxane containing a curing catalyst selected from the group consisting of quaternary ammonium salt of carboxylic acids, quaternary ammonium hydroxides and quaternary ammonium alkoxides.





#### HANDLING MEK

"Properties and Essential Information for Safe Handling and Use of Methyl Ethyl Ketone" is the title of the latest chemical safety data sheet, SD-83. The safety data sheet details the properties, hazards, engineering control of hazards, employee safety, fire fighting, handling and storage, tank and equipment cleaning and repairs, waste disposal, medical management, and first aid. Copies are available for \$0.30 per copy from the Manufacturing Chemists' Asso., Inc., Dept. PVP, 1825 Connecticut Ave., N. W.. Washington 9, D. C.

#### CONTRACT PACKAGERS DIRECTORY

The fourth edition of the "Directory of Contract Packagers and Their Facilities" has just been released to P. I. Corporate Members.

It is a compilation of the results of a questionnaire sent to contract packagers to establish areas of specialization. **Packaging Institute, Inc.**, Dept. PVP, 342 Madison Ave., New York 17, N. Y.

#### HYDROCARBON RESIN EMULSION PRODUCTS

A 12-page brochure, describing nine different hydrocarbon resin emulsion products, has been published. These emulsions offer the opportunity for a compounder to design waterproof and moisture-resistant products starting with a water base system. Pennsylvania Industrial Chemical Corporation, Dept. PVP, Clairton, Pa.

#### FORK TRUCK

A revised four-page bulletin (SS-207) with information on gas-powered, cushion-tired 2,000 pound capacity fork trucks was recently issued. It is illustrated in two colors, has updated specifications on upright dimensions, grade and drawbar pull, travel speeds and gradeability. Clark Equipment Company, Dept. PVP, Buchanan, Michigan.

#### THICKENER FOR EMULSION PAINTS

Recently issued, Technical Data sheet TI-214 discusses the use of Attagel to replace all or a part of organic thickeners used in emulsion paints. Attagel is an insoluble, colloidal form of the mineral attapulgite and serves as both a thickener and extender, and offers several advantages over organic thickeners normally used in emulsion paints. Minerals & Chemicals Phillip Corporation, Dept. PVP, 4000 Essex Turnpike, MenloPk, N. J.

#### WATERSOLUBLE COPOLYMERS

The first in a series of new water-soluble copolymers, this comprehensive forty-page data bulletin is now available. The bulletin describes Gantrez An resin currently available in three molecular weights. The resin is water-soluble polyelectrolyte. The publication also describes the physical, chemical and physiological properties of this linear polymeric anhydride. The Commercial Development Department, General Aniline & Film Corp., Dept. PVP, 435 Hudson Street, N. Y. 14, N. Y.





#### EXTERIOR LATEX PAINTS

A pamphlet on exterior latex paints for wood substrares by Mr. Sidney Werthan of the New Jersey Zinc Company written for the Zinc Pigments Committee of the American Zinc Institute has been made available. It originally appeared in the September issue of "Official Digest". American Zinc Institute, Inc., Dept. PVP, 292 Madison Avenue, New York 17, N. Y.

#### LINING MANUAL

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A brochure "Why Do Bennett Linings Give Better Protection" describes many uses for clear and pigmented linings, in epoxy and phenolic types. The brochure with sample lined steel chips is available to pail and drum users. **Bennett Industries, Inc.,** Dept. PVP, 135 Washington St., Peotone, Illinois.

#### MICROSCOPE

A six-page folder covering the EM-200 Electron Microscope is now available. The folder discusses resolving power, magnification range, accelerating voltage, micrographic facilities, focussing astigmatism compensation, electron diffraction, specimen chamber cooling, specimen holder, aperturing, and electron optical system. Philips Electronic Instruments, Dept. PVP, 750 South Fulton Avenue, Mount Vernon, N. Y.

#### MANUFACTURING ENGINEER-ING BROCHURE

Recently issued, a fourteen-page brochure on Manufacturing Research and Engineering discusses case histories on: setting up new manufacturing facilities; revising antiquated production facilities; best operations to automate for greatest return; and analyzes investments for assembly machines. Manufacturing Systems Div., Designers for Industry, Inc., Dept. PVP, 4241 Fulton Parkway, Cleveland 9, Ohio.

#### ASTM PROCEEDINGS

The 1960 ASTM Proceedings, Volume 60, is now available. It contains the official record of the proceedings of the Society for the entire year. It records technical accomplishments with reports and papers, together with discussions, which were offered and accepted

by the Society for publication in the Proceedings. With 77 reports of technical committees and 44 technical papers on subjects pertaining to research and standards for materials, the book has infinite value as a reference book. Cost is \$12.00—ASTM Members— \$8.00. American Society For Testing and Materials, Dept. PVP, 1916 Race Street, Philadelphia 3, Pa.

#### HEAD LOSS CHARTS

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As long as the supply lasts, Head Loss charts are available free to any paint and varnish production or engineering personnel. The friction head (built up by the 'rubbing' of the liquid against the inside walls of which it flows or is forced through) for any viscosity liquid up to 500,000 S.S.U., or Z-10 on the Gardner-Holt Viscometer, can be readily computed for capacities up to 1,000 GPM and for pipe sizes up to 12 inches in diameter.

The friction loss slide rules are invaluable in the selection of the proper horse-power motors for pumps handling the various liquid elements encountered in paint and varnish manufacturing, through the many different piping layouts that might be encountered. **Foster Pump Works, Inc.,** Dept. PVP, 48-A Washington St., Bklyn, N. Y.



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# The Physico-Chemical Properties of Aerosol Propellants

Part II

By Dr. John J. Sciarra\*

In Part I, the use of hydrocarbon and compressed gases as propellants for aerosol paint products was discussed. A discussion of the more important group of propellants, that is, the fluorinated hydrocarbons, was initiated and continues in this installment. Some of the properties of these propellants already covered include boiling points, vapor pressures, and Kauri-Butanol values.

The fluorinated hydrocarbons are characteristic in that they are practially inert chemically. Since they are saturated compounds they are unaffected by most substances. However, since they contain varying atoms of fluorine and chlorine, the stability of the compound in water should be considered. While one would expect the carbon to halogen bond to be a relatively strong bond, the nature of the other components as well as the environmental conditions will influence the strength of this bond. ruptured, the propellants will form hydrochloric acid, which is corrosive to the container in addition to possible reaction with the product concentrate followed by decomposition. This danger of hydrolysis is found when using Propellant 11 (trichloromonofluoromethane) and not to any great extent using Propellant 12 (dichlorodifluoromethane) and Propellant 114 (dichloro-

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Phenol

ydride phenol tetrafluoroethane). One would not expect a completely fluorinated compound, such as Propellant C-318 (octafluorocyclobutane) to hydrolyze.

As one can see from the chemical structures, those compounds showing symetrical arrangement of the halogens generally show decreased hydrolysis. In asymetical compounds such as Propellant 11, most of the electrons are pulled closer to the carbon to fluorine bond since fluorine is more electronegative than chlorine. As a result the carbon to chlorine bond is weakened resulting in a breaking of the bond and the liberation of hydrochloric acid.

As fluorine is introduced into a propellant the hydrolytic stability of the compound is increased. This is generally due to a shortening of the carbon to chlorine bond and as this distance becomes shorter, the bond becomes stronger and therefore shows resistance to rupture. Table VI shows the hydrolysis rates of some of the commonly used propellants. The figures in this

table have been obtained by saturating a liter of distilled water with the vapor of the propellant. This saturation is maintained by keeping a slight positive pressure in the container. The flask is then adjusted to the conditions of the test, such as temperature, salt concentration, pH, etc. From time to time aliquots of the solution are removed and analyzed for chloride ion. Since the hydrolysis rates are extremely low, they are generally expressed as grams of propellant hydrolyzed per liter of water per year. These figures are expressed at a temperature of 86°F. (30°C.)

The rate of hydrolysis is a function of the hydroxyl ion (OH)concentration and as the alkalinity of the preparation increases, one can expect an increase in hydrolysis. Similarly an increase in temperature will bring about an increase in hydrolysis.

While hydrolysis becomes an important factor in the formulation of aerosols containing water, it is not a serious consideration for paint formulations since, for the most part, the formulations are anhydrous. However, unless the aerosol paint products are filled properly, there is the danger of the product becoming contaminated with water during the cold filling process (see This Journal, October, November, 1960). In the absence of water the fluorinated hydrocarbon propellants are unreactive toward the ordinary metals used in

<sup>\*</sup>Associate Professor, St. John's University, College of Pharmacy, Jamaica 32, New York

TABLE VI Rate of Hydrolysis of Commonly Used Propellants

Propellant	Water Alone	Sodium Carbonate 1%	Water with Steel Strips	Water with Copper Strips
11	0.005	0.12	1.9	0.18
12	0.005	0.04	0.8	0.005
114	0.005	0.01	1.4	0.005
C-318		0.0022*		

<sup>\*</sup>determined in 10% Sodium Hydroxide solution.

aerosol containers. Recently the reaction between ethyl alcohol and Propellant 11 was investigated by Sanders and a possible mechanism for this reaction was proposed. The basic reaction taking place was one of the free radicle type resulting in the formation of aldehydes which were corrosive to the containers. The following equations represent the reactions taking place as proposed by Sanders:

C<sub>2</sub>H<sub>2</sub>OH + C Cl<sub>3</sub> F→ CH<sub>4</sub> CHO + CH Cl<sub>2</sub> F + HCl Acetaldehyde CH<sub>3</sub>CHO + 2 C<sub>2</sub>H<sub>2</sub>OH→ CH<sub>4</sub>CH(OC<sub>2</sub>H<sub>2</sub>)<sub>3</sub> + H<sub>2</sub>O Acetal 2H<sub>6</sub>OH + H Cl→ C<sub>2</sub>H<sub>5</sub>Cl + H<sub>2</sub>O Ethyl Chloride

This reaction was found to take place in both aqueous and nonaqueous systems and was initiated by such substances as benzoyl peroxide. In the absence of an free radicle initiator, the reaction did not take place. The investigators then turned their attention toward substances which would inhibit this free radicle reaction and found that substances such as nitromethane were effective. As a result of this work, E. I. du Pont de Nemours announced earlier this year the availability of a stabilized trichloromonofluoromethane known as Propellant 11S. This is Propellant 11 with the addition of nitromethane and could be safely used in the presence of ethyl alcohol. While this overcomes the reaction with ethyl alcohol, it does not affect the hydrolysis rate of Propellant 11 in aqueous aerosol products.

Another interesting property of the fluorinated hydrocarbons is their solvent power. In addition to the pressure exerted by the propellant in the container, the propellant, being in the liquid state, presents problems related to solubility. Therefore, the solvent power of the propellant must be considered. In certain products the propellant can act as a solvent in addition to supplying the pressure

to expel the contents from the container. In other products, the presence of the propellant presents a problem due to its non-miscibility with the remainder of the aerosol formulation. Hildebrand has developed a system whereby one can predict the miscibility of various substances by assigning a solubility parameter to each substance. As the difference between the solubility parameter of two substances decreases, the compounds become more and more miscible finally resulting in mutual solubility. Table VII shows the solubility parameters for some commonly used propellants and other substances.

Since the fluorinated hydrocarbons are nonpolar organic liquids, they are good solvents for similar types of materials. Water and other highly polar substances are practically nonmiscible with the propellants. Fortunately, the solvents used in aerosol paint products are generally nonpolar and are miscible with the commonly used propellants. Table VIII shows the solubility relationship between some of the commonly used propellants and water at 70°F.

There are several other physicochemical properties of fluorinated hydrocarbons but are not too important in the formulation of aerosol paint products. Such properties as surface tension, specific heat viscosity, specific gravity, freezing point, and heat of vaporization are given in Table IX.

It has previously been stated

that the vapor pressure of a fluorinated hydrocarbon is constant at any one temperature and is a property of the individual propellant. By mixing two or more propellants of different vapor pressure, a mixture is formed having a vapor pressure intermediate in value from the two original propellants. According to Raoult's Law, the vapor pressure of a solution is dependant upon the vapor pressure of the individual components. For ideal solutions, the vapor pressure is equal to the sum of the mole fractions of each compound present, multiplied by the vapor pressure of the pure compound at the desired temperature. Mathamatically, this can be expressed as:

TABLE VII Solubility Parameters

	T OFF STREET
C	Solubility
Compound	Parameter
Propellant 11	7.5
Propellant 12	6.0
Propellant 114	7.3
Ethyl Ether	7.3
Ethyl Alcohol	11.1
Water	22.0
Ethylene Glyco	14.0

$$\frac{pA = nA}{nA + nB} = NA pAo$$
Where

Where where
pA = partial vapor pressure of component A
pAo = vapor pressure of pure substance A
NA = mole fraction of component A nA = moles of component A nB = moles of component B Total Vapor Pressure = pA + pB

Applying this law to a specific system of propellants used in the formulation of aerosol paint prodlants used in the formulation of aerosol paint products, one can calculate to within 5% the vapor pressure of a mixture of 50% Propellant 12 and 50% Propellant 11 at 70°F in the following manner: Propellant 11—Molecular weight—1374, Vapor Pressure—13.4 psia.
Propellant 12—Molecular weight—120.9, Vapor Pressure—84.8 psia

moles of propellant 11 = 50

=0.364 moles Propellant 11 137.4 moles of

=0.414 moles Propellant 12 120.9 Total moles = 0.364 + 0.414 = 0.778 Mole Fraction of Propellant 11 = 0.364

propellant 12 = 50

=0.4680.778 Mole Fraction of Propellant 12 = 0.414 =0.5320.778

Partial Pressure of
Propellant 11 = 0.468 x 13.4 = 6.27 psia
Partial Pressure of
Propellant 12 = 0.532 x 84.8 = 45.11 psia
Total Pressure of
Propellant 11/12 (50/50) = 6.27 + 45.11 = 51.38
psia. or 36.68 psig.

TABLE VIII

Solubility Relationship between Propellant and Water Water in Propellant\* Propellant in Water\* Propellant 0.0090 11 0.1 0.0076 12 0.03 0.02 0.007 114

\*per cent by weight

TABLE IX

Selected Properties of Commonly Used Propellants

Specific Heat———					
Propellant	Surface Tension dynes/cm. at 25°C.	Liquid cal/Gm30°	Vapor cal/Gm.30°C.	Visiosity Liquid	at 30°C. Vapor
11	19	0.21	0.14	0.41	0.011
12	9	0.24	0.15	•0.25	0.013
114	13	0.24	0.16	0.36	0.012
Speci	fic Gravity	Freezing Point °C		of Vaporization Gm. at 1 atm.	
	1.49	-111	***	43.5	
	1.33	-158		39.5	
	1.47	-94		32.7	

Tables are available showing the vapor pressure of various mixtures of propellants.

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1 = 51.38

Before concluding any discussion on the properties of the fluorinated hydrocarbons, the toxicity and flammability should be considered. The toxicity has been previously indicated and it has been concluded that the fluorinated hydrocarbons are perfectly safe for aerosol application. The classification according to the underwriters Labora-

tory ratings have been given in Table II and need not be repeated here. The only danger involved would be if the product were sprayed into an open flame or on a red hot surface. This would cause decomposition of the propellant to form extremely irritating substances. However, it is highly unlikely that aerosol paint products would be subjected to this type of treatment.

The fluorinated hydrocarbons

are nonflammable and nonexplosive. The introduction of halogen atoms into a hydrocarbon will reduce the flammability. In fact, many of the propellants make good fire-extinguishing agents. However, the nature of the accompanying solvents used in the formulation will determine the flammability. In all cases the aerosol product will be less flammable than the nonaerosol product.

To be concluded

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#### New Valve Producing Even Application

One of the basic problems with the paint and water-base product advent of aerosol dispensers has been one of obtaining an even coating or near-perfect coating. Many aerosol dispensers have aotendency of unevenly applying the product and, even allowing it to run down the can. This, of course, is due to a faulty valve.

Basically, correlation between propellant and product play the main part in spray, but, unfortunately, the chemical work has almost totally been left up to the propellant manufacturers.

The Maruichi Manufacturing Co.

of Tokyo, Japan, recognized this and set about to produce a valve that would solve the problem. They have designed just such a new valve. When the actuator button is depressed, the spray (surrounded by propellant) is released from both sides of the nozzle, which permits an even flow of approximately 15 mm wide and 200 mm long. This is especially helpful in the application of paints. This spray pattern omits the messy leaking or running of the paint.

A special lip-shaped nozzle has been especially designed for the use of aerosol paints. In using the new button and valve, an area two to three times is covered with one application even though the contents are equal in comparison with conventional values.

#### CSMA Holds Annual Meeting December 4-6

December 4th thru the 6th marks the 48th annual meeting of the Chemical Specialties Manufacturers Association at the Hotel Roosevelt in New York City.

About 1,000 delegates are expected to attend general sessions and over 50 technical papers will be presented at the technical meetings of the trade association's aerosol, automotive, insecticides, waxes and floor finishes, disinfectant-sanitizers, and detergents-sanitary chemical products divisions.

General session and luncheon speakers will include Larry Coleman, general counsel for Allied Chemical & Dye Corporation; Richard C. Hottelet, CBS news commentator; and William Bryan, vice president of Humble Oil & Refining Company.

Another highlight of the three-day meeting will be the Aerosol Division's world-wide packaging contest. Over 400 entries, representing over 2,000 different types of products now available in push-button packages that chalked up retail sales of nearly \$870 million last year, will be judged by a panel of five merchandising and design authorities. Winning packages will be announced at the meeting and will form the forcal point of a three-day Aerosol Festival display.

#### Large Economy Aerosol Container

The American Can Company has announced the development of the nation's largest aerosol container for consumer use. The container is expected to be introduced commercially in December. The new 24 ounce pressure container holds approximately 50 per cent more product than the present 16 ounce title-holder.

With the introduction of this innovation, packers and retailers may be able to reduce their unit selling price per ounce to the customer.

Thirty-six months of intensive developmental effort was needed to overcome the technical barriers which prevented previous development of the jumbo-size aerosols.

#### RAYOX

Titanium Dioxide

#### NYTAL

Magnesium Silicate

#### **PYRAX**

Ground Pyrophyllite

#### PEERLESS CLAY

Domestic China Clay

#### THERMATOMIC BLACK

Low oil absorption Black

#### RHEOTOL

For leveling and Gloss

#### ACTIV-8

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NEWS OF COMPANIES, ASSOCIATIONS
TECHNICAL GROUPS
ITEMS OF GENERAL INTEREST

A Report On The NPVLA
And Federation Convention

#### NPVLA The Past and Present

The retiring President, Brig. Gen. Joseph F. Battley (U.S.A., Ret'd), in an address to 1500 representatives of the paint industry before the final Business Session of the National Paint, Varnish and Lacquer Association at the Statler Hilton Hotel in Washington, called for a more imaginative approach to business management as a means of adjusting to the demands of the tense international situation. He went on to state that we would be living in a Cold War Status for some time to come, and not only in Berlin and Laos, but in the Near East, Middle East, Far East, Africa, a good deal of Europe and Latin America right at our own doorstep. Battley went on to state, "be flexible and not rely solely on tight operational controls," and, "You must be ready to change directions or products in ways which will help you continue to make a profit. He also pointed to technological awareness as a key to prosperity in

these troubled times. "Failure to keep up with the industry's scientific advances means the end for the 'Gay 90's' manufacturer." He noted, however, a critical shortage of chemists and chemical engineers. "...In this era, science and survival go hand in hand." At the conclusion of his summary of his fourteen-and-a-half years tenure of office, he introduced William E. Hood, the new President of NPVLA.

William ("Billy") E. Hood, was elected to the Board of Directors in 1960. He has served as a member of the Scientific Committee, Chemical Coatings Steering Committee, National Membership Committee and Public Relations and Publicity Committee. He was Vice-President of the Association in 1959, and Regional Vice President for the Southern Zone in 1958.

Robert A. Roland was appointed as Executive Vice-President.

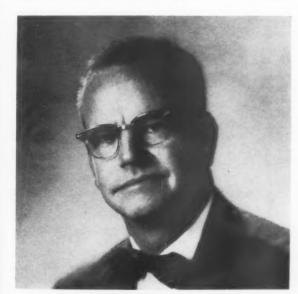
#### Advertising and Sales Promotional Managers Forum

At a forum held on October 30th,

R. S. Lowell, Director, Advertising and Sales for the United States Plywood Corporation, delivered an address on the various aspects and needs for advertising. He discussed the mountainous amounts that are spent by corporations with reference to management and budgets. He noted that although advertising takes a big bite of a corporation's budget, it has proved itself time and time again. He stressed "More and more it is coming to be accepted that advertising is a communication device rather than a selling device. Selling still has to be done by salesmen... With reference to the Paint and Varnish industry, he pointed out that more products are being produced to compete with the market making it imperative that a good advertising campaign be utilized. He stated, "It is no longer a question, it seems to me, of whether or not individual manufacturers feel that they want to do this type of advertising, but, it seems to me that collectively your industry must engage in this type of effort.'

#### **FEDERATION**

Registration at the 39th Federation Meeting held in Washington, Nov. 1-4th totalled close to 3500 as paint technologists from the United States, Canada and even some from Europe and Japan convened to hear and discuss the latest technical developments taking place in the paint field.



William ("Billy") E. Hood President NPVLA



Robert A. Roland Executive Vice President NPVLA

### **NEWS**

The keynote speaker for the 39th meeting was Dr. Carl F. Prutton director-consultant of FMC Corporation.

Dr. Louis Arnold Jordan, founder-director of the Paint Research Station, Teddington, England delivered this year's annual Joseph J. Mattiello Memorial Lecture.

#### **New Officers**

The new Federation officers for 1961-1962 term include:

President—William L. Foy, of Foy Paint Company, Cincinnati; President-Elect—Lyman Hunter of Bennett's, Salt Lake City. Treasurer—Charles W. Finegan of Rinshed—Mason Co. Los Angeles. C. Homer Flymn remains Executive Secretary. Next year's annual meeting will be held October 15-17 in St. Louis.



William L. Foy President



Lyman Hunter President Elect

#### **Paint Show**

As in recent years, the emphasis of the 26th Paint Industries' Show in Washington was on water paint system. Of the 107 exhibitors, forty-seven were offering materials for the formulation of water-based coatings. These included various latexes, oil and resin emulsions, water-soluble resins and pigments, extenders and additives specifically designed for water systems.

A run down of important materials offered for the first time to the paint industry and exhibited at this show follows:

#### Intermediates

Chlorendic anhydride, a di-functional anhydride, was exhibited for use in the synthesis of soybean oilmodified glycerol chlorendate alkyd resin complying with the requirements of MIL-R-21417 (ships).

Tris (Hydroxymethyl) aminomethane was demonstrated as an upgrader for alkyd resins, especially in improving chemical resistance, adhesion glass retention and drying time.

This benefit of using benzoic acid in alkyd formulations featured one manufacturer's exhibit. Among these benefits include gloss, hardness and chemical resistance improvement.

#### Resins

High molecular linear epoxy resin attracted considerable attention as a film forming resin for producing surface coating by solvent evaporation alone. In addition to its ability to form lacquer-type coating alone, the hydroxyl functionality of this epoxy resin permits the use of cross-linking agents such as urea, melamine, triazine or phenolics, anhydrides and diisocyanates.

As series of high molecular weight polymers based on butadiene and containing varying degrees of carboxyl functionality have been suggested for use in industrial coatings such as beer can base coats, container coatings and metal primers, Other resin exhibited for the first time include a thermosetting acrylic resin in water solution, which, according to the manufacturer, cures at elevated temperatures to form hard films with outstanding chemical resistance, gloss and color retention; a new light-colored hydrocarbon resin for use in alkyd

finishes; a heat-reactive polymer which combines low cost with light color and versatility; a crystal clear, hard styrene type resin which is soluble in aliphatic solvents is said to be compatible with most of the styrene and vinyltoluene modified commercial alkyds which are used in industrial baking enamels; a thermosetting acrylic for applicance coatings; a water soluble thermosetting resin for primers; and a two-component system for producing spatter-type finishes on cement blick and the like.

#### Pigments

Hansa- type pigments to meet the formulating requirements of lead-free finishes, universal colorants, and more durable, alkali-fast paints; vat pigment possessing good tinctorial strength for producing rich maroon tones; an inorganic yellow pigment with outstanding lightfastness and excellent alkali resistance; yellow vat pigment with excellent alkali resistance and light fastness and a vat-toner (Imidazole type) with high tinctorial strength and lightfastness at very low concentrations,

#### Extenders

High brightness and high whiteness hydrated aluminum silicate for latex and interior house paints; a blended hydrated aluminum silicate for spackling, caulking, texture paints; fine size silica gels for flatting alkyd-urea, and polyurethane finishes via ball or pebble mill dispersion; highly purified aluminum silicates of good whiteness for use in exterior and interior paints: hydrous calcium silicate for emulsion paints where it displays good hiding power at low concentrations; and silica aerogel with greater surface area as a more efficient flatting agent for alkyd varnishes.

#### Latex Emulsions

Newly designed styrene butadiene type of latex that gives maximum flow and leveling with the use of synthetic thickeners; vinyl acrylic copolymer having good gloss and resistance to water for interior and exterior paint systems; a small particle size vinyl acetate copolymer which combines broad formulating latitude with good mechanical stability and water resistance; an acrylic emulsion polymer specifically designed to give excellent outdoor durability on wood surS

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faces; polyvinyl acetate emulsion in which color development is imparted by a most unusual process while retaining all other advantages of water paint emulsions.

#### Additives

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Among the additives introduced at this year's paint show for the first time included the following:

A glossing-leveling agent which is claimed to improve gloss and increase sheen on both porous and non-porous surfaces and also helps in color development and improves hiding power; a liquid ultraviolet light absorber which is completely miscible with mineral spirits and non-reactive with metallic driers, which according to the manufacturer, is stable to bases up to pH10 and does not react with secondary or tertiary amines; a non toxic fungicidal and bactericidal agent; An anti-foaming agent that does not separate; A heat-resistant additive for precise control of flow, body and pigment suspension in non-aqueous trade-sale paints; and a heat stable zinc stearate possessing resistance to color degradation at elevated temperatures.

#### Machinery and Equipment

In the way of equipment several improved designs of mixing and dispersing equipment were exhibited at this show.

Of particular interest was a dissolver designed especially for midrange production in batches from 50 to 150 gallons; a heavy-duty mixer-dispenser which, according to the manufacturer, disperses, deagglomerates, dissolves and emulsifies; a high speed dissolving unit fitted with variable speed drive and integral hydraulic cylinder to raise and lower the mixer head; an improved sand grinder for fast, efficient and easily controlled production; and a completely automatic disperser with variable speed push button control.

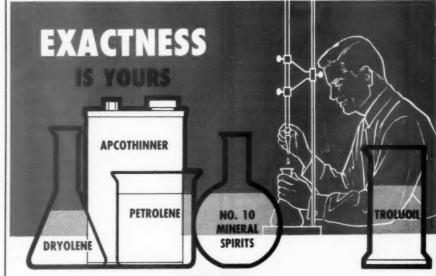
#### W. E. Santoro Elected Society Honorary Member

The New York Society for Paint

Technology Inc. has elected W. E. "Tony" Santoro to the Society Honorary Membership Class D. Mr. Santoro has been a Class A Member for the 20 years, and has not missed a single regular meeting in 15 years. He served through various chairs and was elected President in 1954. His untiring efforts on behalf of the Society has earned him unmeasured praise and devotion. His outstanding work in the industry on basic research and development in the metal decorating and canning industries and industrial finishes has earned him the reputation as an expert and authority in this field.



W. E. Santoro



### with APCO Solvents

Need a very fast drying lacquer solvent diluent? Try PETROLENE. A fast drying thinner for spraying enamels? Use TROLUOIL. A relatively slow drying solvent for synthetic resins? NO. 10 MINERAL SPIRITS.

In paints requiring slow initial drying and fast final drying, APCOTHINNER is the answer. But in stains where fast setting and relatively slow final dry is preferred, specify DRYOLENE, our VM&P with an I.B.P. of 200°-210°F.

For other requirements, APCO has other solvents. You can be as versatile and as precise in formulating as you want to be, when you rely on the broad line of APCO Industrial Solvents.





December 4-6. Chemical Specialties Mfrs. Assoc., 48th Annual Meeting, Roosevelt Hotel, New York City.

Jan. 29-31, 1962. Spring Meeting of Committee D-1, ASTM, Statler Hotel, St. Louis Mo.

Feb. 13-16, 1962. 78th Annual Meeting of the Painting and Decorating Contractors of America, Americana Hotel, Miami Beach, Fla.

Feb. 22, 1962. Protective Coatings Div., Chemical Institute of Canada, Seaway Hotel, Toronto.

Feb. 23, 1962. Protective Coatings Div. Chemical Institute of Canada, Windsor Hotel, Montreal.

Mar. 1-3. 1962. 6th Biennial Spring Symposium and Paint Materials & Equipment Show of the Pacific Coast Societies for Paint Technology, San Francisco, Calif.

Mar. 14-17, 1962. Annual Meeting of Southern Society for Paint Technology, Robert Meyer Hotel, Jacksonville, Fla.

May 11-12, 1962. Pacific Northwest Society for Paint Technology. Sheraton Hotel, Portland, Ore.

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### **NEWS**

SECRETARIO DE PROPERTO DE CONTRADO DE

#### Coatings and Plasticizers From Tung Oil

New types of protective coatings and plasticizers are among the prospective uses for tung oil, according to information given the research committee of the Pan-American Tung Research and Development League during a recent conference with scientists of U. S. Department of Agriculture's Southern Utilization Research and Development Division in New Orleans.

It was noted that synthetics are replacing the vegetable drying oils in the coatings industry, and that tung as well as other vegetable drying oils will have to find new outlets. The best prospects appear to be as raw materials for the chemical industry. Considerable work has been done at the Southern Division toward developing plasticizers from tung oil and that in evaluation tests some of these have shown excellent properties, including improved moisture resistance.

It was noted that a simple and reliable method of analysis of the tung oil used in paint formulations is needed.

#### Can Makers Shipments Continue Record Pace

According to the Can Manufacturers Institute, can shipments for the first seven months of 1961 were up 8.2 per cent over the same period in 1960.

According to Rueben L. Perin, president of the Institute, it is probable that shipments for 1961 will exceed the record set in 1959.

In the non-food categories, paint and varnish cans showed a 14.4 per cent rise while pressurized containers moved ahead 8.6 per cent. Aluminum cans were up 70.5 per cent over last year.

#### Subsidiary Formed For Chemical Processing Equip.

A new firm, Process Equipment Trading Co., has been formed as a subsidiary of the Patterson Foundry and Machine Co., of East Liverpool, Ohio. Howard Crossley was appointed General Manager. The new company was formed after a comprehensive study of customer requirements was made. It was found that countless companies were stymied in their modernization programming because of huge capital investments which were tied up in replacement plant equipment. Process Equipment Trading Co. will take in surplus equipment as partial payment on new Patterson equipment and offer a wide variety of financing programs. The old equipment will be rebuilt or converted for resale.

#### New Vinyl Acetate Monomer Plant Site Selected

The National Starch and Chemical Corporation has purchased a site on which their 4 million-dollar vinyl acetate plant will be erected later this year. The new location is Seadrift, Texas. The expected annual capacity of the new chemical facility will be 45 million pounds, most of which will be for captive use. The plant is expected to be in operation in the latter part of 1962.



The new Sherwin-Williams Research Center recently opened in Chicago. It houses the analytical, paint, resin and mineral products research laboratories. Arthur B. Holton, technical director for the company, estimates that over \$1 million dollars will be spent on research activities during the coming year.

# PERSONNEL CHANGES

CONTINENTAL CAN CO.

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Fred W. Hoover, Jr. recently joined Continental in the capacity of assistant to the president, Thomas C. Fogarty. Mr. Hoover was previously senior vice president of Langendorf United Bakeries.







Ludolph H. Conklin

#### INTERCHEMICAL CORP.

**Ludolph H. Conklin** was appointed manager of product development and technical service for the R-B-H plant of Interchemical's Color & Chemicals Division

**Arthur Mastro** was appointed manager of process engineering and control of pigment dispersions for plastics products.

Walter Semchyshyn was appointed process engineer at R-B-H, with responsibility for dispersions for coatings and inks.

**Dr. Lino J. Radi** was assigned to the R-B-H sales department in a staff capacity as a representative and advisor on plastic problems, particularly in the area of polyolefins.



George J. Hutzler



James Willis

#### SPENCER KELLOGG

Spencer Kellogg Division of Textron Inc. recently announced the appointment of **George J. Hutzler** as Director, Spencer Kellogg Research Center.

James Willis was promoted to District Sales Manager of the Philadelphia area. He succeeds Richard A. Nagel who was promoted to Eastern Area Sales Manager.

#### GREAT LAKES CARBON CORP.

Dr. Le Roi E. Hutchings was recently appointed as an associate director of research. He was previously associated with Pure Oil Company where he served in the capacity as Director. Process and Product Research Division.

#### MARBON CHEMICAL

Martin H. Schneider was recently named technical sales representative for Marbon Chemical Division of Borg-Warner Corporation. His territory will cover 21 central states with head-quarters in Chicago.

#### THOMAS PAINT PRODUCTS CO.

W. T. McEntire was recently promoted to the position of Plant Manager for Thomas Paint Products Co. He will have charge of all phases of production, purchasing, and personnel management in the factory and office. He has been with Thomas for the last four years.

#### CIBA COMPANY, INC.

Dr. William A. Raimond was appointed to the position of deputy technical director for the company. Dr. Raimond has been associated with American Cyanamid Company since 1942. He will assist Dr. Charles J. Weidmann, vice president and technical director.

#### ARTHUR COLTON COMPANY

F. D. "Dave" Wooten has been appointed Chicago Branch Manager. In his new position he will direct sales staff operations for seven Midwestern states from the Chicago branch office.

#### MINNESOTA LINSEED OIL CO.

Max Kantor, formerly vice-president of research at Honeymead Products Company, has joined Minnesota Linseed oil Company, as vice-president in charge of technical oils, sales and service.

#### SHAWINIGAN RESINS CORP.

Robert H. Lynch joined Shawinigan Resins Corporation's Advertising and Sales Promotion Department as advertising copywriter.

#### METAL & THERMIT CORP.

Four group vice presidents were recently appointed by Metal & Thermit Corporation.

H. E. Hirschland was designated as group vice president with the Commercial Development and Research Divisions.

**B. W. Weber** is group vice president in charge of the Manufacturing, Employee Relations and Administration Divisions

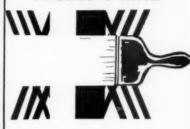
J. L. Oberg is group vice president in charge of the Minerals, Ceramics and Welding Divisions.

D. W. Oakley is group vice president for the Chemicals, Coatings, and Plating Divisions.

#### **UNIQUE FEATURES**

7kat

The ENGLISH MICA Co.
PRODUCTS HAVE



They provide an increase in hiding power of approximately 12% in many exterior oil and emulsion coatings.

Tests show that only  $y_3$  as much English Mica need be used to replace other commonly used extenders . . . and this replacement does not appreciably affect viscosity.

325 Mesh Waterground Mica Micro Mica C-1000 Micro Mica C-3000

These three grades offer three different degrees of flatting, angular sheen, and fineness of grind . . . not obtainable with other micas. The Micro Micas exhibit no sparkle from coarse particles, even on extremely weathered surfaces.

#### The English Mica Co.

RIDGEWAY CENTER BUILDING, STAMFORD, CONN.

#### CLASSIFIED ADVERTISEMENTS

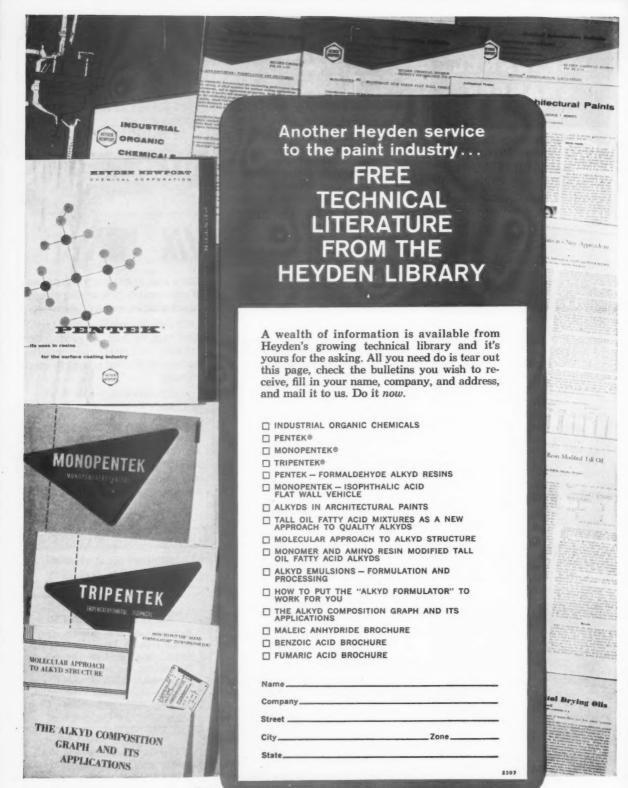
Rates; \$.20 per word, except those seeking employment, for which rate is \$.10 per word. Minimum: ten words. Address all replies to Box Number, c/o Paint and Varnish Production, 855 Avenue of the Americas, New York 1, New York.

#### AGITATOR MOTORS

15 H.P. geared agitator motors; Vertical; Explosion proof. Speed 68 RPM; Designed for 4,000 gal. tanks. New. Davenport, Box 18152, Louisville 18, Ky. Iu 2-2661.

#### PEBBLE MILLS

4 Pebble Mills—available for sale. Ceramic lined, motors and drives complete. Cordo Chemical Corp., 34 Smith Street, Norwalk, Conn.





#### **HEYDEN CHEMICAL DIVISION**

Heyden Newport Chemical Corporation 342 Madison Avenue, New York 17, New York

#### SUBJECT INDEX For Volume 51 January-December, 1961

Issue	Page	Issue	Page
A		C	
Acid Esters and Styrene, The	47	Capitol Tools Up for Growing Aerosol Paint	
Aerosol Containers, Aluminum Apr.	99	MarketMay	53
Aerosol Laboratory, How to Set-Up an		Central Filing Speed Orders to CustomersOct.	73
Part IFeb.	89	Centrifugal Mixers, Dry Blending of Powder	
Part IIMar.	85	Paints withApr.	71
Aerosol Paint Products, Labeling of		Chlorinated Alkyds for Fire Retardant Paints Nov.	53
Part IJune	105	Chlorinated Rubber and Alkyd Traffic Paints. Sept.	63
Part IIJuly	93	Coatings Industry, Recent Trends in Solvents	
Aerosol Paints, Diversification and Standard-		for theJune	37
ization Help Growth of	93	Control Should Provide Action	51
Aerosol Paints, Formulation of May	39		
Aerosol Paints, Large Scale Production of		D	
Part ISept.	115		
Part IIOct.	105	Discipline, Aspects of Nov.	127
Aerosol Production, Ampruf Paints StartsMay	50	Diversification and Standardization Help	
Aerosols, Painting Murals withJuly	96	Growth of Aerosol PaintsAug.	93
Alkyd Resins, Fatty Acids vs. Whole Oils in Apr.	43	Dry Blending of Powder Paints with Centrifugal	
Alkyd Resins—Recent Trends		MixersApr.	71
Part IFeb.	47		
Part IIMar.	35	E	
Part IIIMay	59		
Part IVJune	49	Effect of Radiation, Humidity and Atmospheric	
Part VAug.	43	Condition on the Mechanical Properties of	
Part VISept.	75	Paint and Varnish FilmsFeb.	25
Part VIIOct.	49	Efficient Flatting AgentJuly	54
Part VIIINov.	87	Evaluation of Test Traffic Marking PaintsSept.	55
Part IXDec.	47		
Alkyd Traffic Paints, Chlorinated Rubber and . Sept.	63	F	
Aluminum Aerosol ContainersApr.	99		
Antimony Silico Oxide Pigment, Flame Re-		Fatty Acids vs. Whole Oils in Alkyd ResinsApr.	43
tardant Coatings Based on Nov.	71	Fire Retardant Additive for Latex PaintsNov.	65
R		Fire Retardant Latex CoatingsNov.	57
		Fire Retardant Paints, Chlorinated Alkyds for Nov.	53
Ball Valve Manifold Controls Flow of Liquid		Fire Retardant Paints, Formulation ofNov.	79
MaterialsJuly	71	Flame Retardant Coatings Based on Antimony	
Batch Weighing	131	Silico Oxide PigmentNov.	71
Blistering of Painted Steel		Flatting Agent, EfficientJuly	54
Part IJuly	31	Flow of Liquid Materials, Ball Valve Manifold	
Part IIAug.	49	ControlsJuly	71
Part IIIOct.	41	Foreman Training as a ProcessOct.	67
Boilers, Pent-Oxone and Pent-Oxol, Versatile		Formulation of Aerosol Paints	39
NewJune	25	Formulation of Fire Retardant PaintsNov.	79

Issue	Page	Issue	Page
Formulation Versatility, Submersion-Heated	72	Painted Steel, Blistering of	
Kettle ProvidesJune	73 79	Part IJuly	31
Frontiers of Management	33	Part IIIAug.	49 41
Furniture Finishes, Wodern NitrocentioseApr.	33	Part IIIOct. Painting Murals with AerosolsJuly	96
G		Pent-Oxol, Versatile New Boilers, Pent-Oxone	
Gas Evolution in Zinc Dust PaintsMar.	25	andJune Pent-Oxone and Pent-Oxol, Versatile New	25
Grinding Media, High DensityJan.	73	BoilersJune	25
Group Creative ThinkingApr.	67	Perfuming, IndustrialDec.	37
Н		Petroleum ThinnersOct. Physico-Chemical Properties of PropellantsNov.	99 153
Hiding of White Enamel by Toning, Increase		Piping, Modern	75
ofDec.	52	Polish Paint Industry on Long Road to Re-	
High Density Grinding MediaJan.	73	coveryJune	93
High Durability, Urethane Wood Finishes ofMar.	41	Polymerization of Fatty Acid Esters and	477
Highway Edgelining Cuts Down Accidents Sept. How to Set-Up an Aerosol Laboratory	69	Styrene	47
Part IFeb.	89	Blending of	71
Part II	85	Profits and Wages, Managerial and Economic	
		Aspects ofJuly Propellants, Physico-Chemical Properties of	67
		Part INov.	153
Improving Managerial PerformanceFeb.	63	Part II Dec.	93
Increase of Hiding of White Enamels by Toning. Dec.	52		-
Industrial PerfumingDec.	37	R	
J		Radiant Heating, Modernized Resin Kitchen	
Job-Description, A Tool for ManagementSept.	91	UsesAug.	69
V		Radiation, Humidity and Atmospheric Condi- tions on the Mechanical Properties of Paints	
N.		and Varnish Films, The Effects of Feb.	25
Kill or Cure a Fork Truck, Thirteen Ways toMar.	54	Raw Material Samples, A Reporting System	
1		for Dec.	73
L		Reporting System for Raw Material SamplesDec. Resin, Modernized, Kitchen Uses Radiant	73
Labeling of Aerosol Paint Products		Heating	69
Part I June	105	Resin Production at Rinshed-MasonSept.	87
Part IIJuly	93	Rheology-Its Significance in Paint Manufac-	
Large Scale Production of Aerosol Paints Part I	115	ture and Paint ApplicationJuly	31
Part II. Oct.	105	Rinshed-Mason, Resin Production atSept.	87
Latex Coatings, Fire RetardantNov.	57		
Latex Paints, Fire Retardant AdditiveNov.	65	S	
		Silicas in CoatingsAug.	31
M		Solvents for the Coatings Industry, Recent	27
Management, Frontiers of	79	TrendsJune Styrene, The Polymerization of Fatty Acid	37
Managerial Aspects of MarketingJune	67	Esters and	47
Managerial and Economic Aspects of Profits and	c 19	Synthetic Rubber Resins in Traffic PaintsSept.	47
Wages July	67	Submersion-Heated Kettle Provides Formula-	
Managerial Performance, Improving Feb. Marketing, Managerial Aspects of June	63 67	tion VersatilityJune	73
Mechanical Properties of Paint and Varnish	0,		
Films, The Effect of Radiation, Humidity and		T	
Atmospheric Conditions on theFeb.	25	Thirteen Ways to Kill or Cure a Fork TruckMar.	54
N		Thixotropic VehiclesOct.	31
		Toning, Increase of Hiding of White Enamels by	52
New Tung Oil Industry, The Jan.	55 33	Tool for Management, Job-DescriptionSept.	91
Nitrocellulose Furniture Finishes, ModernApr.	33	Traffic Marking Paints, Evaluation of TestSept.	55
0		Traffic Paints, Synthetic Rubber Resins in Sept.	47
		Tung Oil Industry, The NewJan.	55
Oils Whole in Alkyd Resins, Fatty Acids vs Apr.	43		
Outlook for 1961Jan.	25	U	
P		Urethane Wood Finishes of High DurabilityMar.	41
Paint Aerosols in England, A SurveyMay	45	-	
Paint Manufacture and Paint Application,		Z	
Rheology—Its Significance in July	43	Zinc Dust Paints, Gas Evolution in	25

#### AUTHORS' INDEX For Volume 51 January-December, 1961

Issue	Page	Issue	Page
Austin, E. O. and Tom Epperson	-	Robinson, Howard H., Jr. and Edwin R. Wolfe	
The New Tung Oil Industry Jan.	55	Resin Production at Rinshed-MasonSept.	87
Bellew, Russell H.		Scherzinger, R. A. and L. C. Norton	
Synthetic Rubber Resins in Traffic Paints Sept.	47	Pent-Oxone and Pent-Oxol, Versatile New	
Boddroff, R. E. and R. F. Wint		BoilersJune	25
Modern Nitrocellulose Furniture Finishes Apr.	33	Schor, Andrew	
Bruss, Herbert		Evaluation of Test Traffic Marking Paints Sept.	55
Rheology—Its Significance in Paint Manufac-	42	Sciarra, Dr. John J.	
ture and Paint ApplicationJuly	43	47th Annual Meeting of Chemical Manufac-	0.2
Daniel, Frederick K.	=0	turers' AssociationJan.	93
Increase of Hiding of White Enamels by Toning . Dec.	52	How to Set Up an Aerosol Laboratory	90
Duzy, Robert H.		Part IFeb.	89 85
Recent Trends in Solvents for the Coatings	37	Part IIMar.	99
IndustryJune Earhart, Kenneth A.	31	Aluminum Aerosoi Containers	39
Fatty Acids vs. Whole Oils in Alkyd ResinsApr.	43	Formulation of Aerosol Paints	39
Epperson, Tom and E. O. Austin	43	Part IJune	105
The New Tung Oil IndustryJan.	55	Part IIJuly	93
Errico, Anthony	33	Large Scale Production of Aerosol Paints	23
Outlook for 1961Jan.	25	Part ISept.	115
Ewalt, W. M. and H. W. Hopton	20	Part IIOct.	105
Chlorinated Alkyds for Fire Retardant Paints. Nov.	5.3	Physico-Chemical Properties of Propellants	100
Fuller, Wayne R	. 00	Part INov.	153
Reporting System for Raw Material Samples Dec.	73	. Part II Dec.	93
Guevin, P. R. and A. G. Hovey	, 0	Shatkin, Lawrence	
Thixotropic Vehicles Oct.	31	Improving Managerial PerformanceFeb.	63
Herzka, A.		Control Should Provide Action	51
A Survey: Paint Aerosols in England May	45	Group Creative Thinking	67
Hopton, H. W. and W. M. Ewalt		Frontiers of ManagementMay	79
Chlorinated Alkyds for Fire Retardant Paints. Nov.	53	Managerial Aspects of MarketingJune	67
Hovey, A. G. and P. R. Guevin		Managerial and Economic Aspects of Profits	0,
Thixotropic VehiclesOct.	31	and WagesJuly	67
Ingram, W. A. and E. K. Zimmerman		Job Description, A Tool for ManagementSept.	91
Flame Retardant Coatings Based on Antimony		Foreman Training as a ProcessOct.	67
Silico Oxide PigmentNov.	71	Aspects of Discipline	127
Kronstein, Dr. Max and Hugh A. Taylor		Talen, Dr. H. W.	
The Polymerization of Fatty Acid Esters and		The Effects of Radiation, Humidity, and At-	
StyreneApr.	47	mospheric Conditions on the Mechanical Prop-	
Lantz, W. J.		erties of Paint and Varnish Films Feb.	25
Gas Evolution in Zinc Dust Paints	25	Taylor, Hugh A. and Dr. Max Kronstein	
Lerstad, William		The Polymerization of Fatty Acid Esters and	
Modernized Resin Kitchen Uses Radiant		StyreneApr.	47
HeatingAug.	69	Van Laar, J.A.W.	
Levinson, Sidney B.		The Blistering of Painted Steet	
Silicas in CoatingsAug.	31	Part IJuly	31
Liberti, F. P.		Part IIAug.	49
Fire Retardant Latex Coatings	57	Part IIIOct.	41
Maass, Dr. Walter B.		Wahlgren, Robert E.	
Polish Paint Industry on Long Road to		Industrial Perfuming	37
RecoveryJune	93	Wells, E. R.	
Mulligan, R. C.		Urethane Wood Finishes of High DurabilityMar.	41
High Density Grinding MediaJan.	73	Wint, R. R. and R. E. Boddroff	22
Norton, L. C. and R. A. Scherzinger		Modern Nitrocellulose Furniture Finishes Apr.	33
Pent-Oxone and Pent-Oxol, Versatile New		Wolfe, Edwin R. and H. H. Robinson, Jr.	87
	25	Resin Production at Rinshed-MasonSept.	01
BoilersJune	20	Zimmermann, E. K. and W. A. Ingram	
Oursler, Henry J.	131	Flame Retardant Coatings Based on Antimony	71
Batch Weighing	131	Silico Oxide PigmentNov.	

IND	EX	0F	ADV
Paul O. Abbé, Inc. Acme Shellac Co. Air Reduction Chemical & Carbide Co., Div., Colton Polymers Dept. Allied Chem. Corp., Plastics Div. C. M. Ambrose Co.	Nov. Nov. 12 Nov.	Oi Ento Ertel Ethy	y Chem l & Refi leter, I l Engine l Corp.
American Cyanamid Co., Pigments Div. In American Cyanamid Co., Plastics & Resins Div. 3rd American Tung Oil Assn. American Zinc Institute American Zinc Sales Co.		Farn Ferro Filpa Food Fran	I. Fales low, Inc lo Corp., loco Indu l Machin klin Mi nd Can
American Zine Sales Co. Amoco Oli Corp. Apco Oli Corp. Arctic Lodges, Inc. Arizona Chemical Co. Aromatic Products, Inc. Atlas Electric Devices Co.	86, 87 99 62 16 Nov. 81	Gene Div Geor Geor	eral Milleral Tire v gia Kao gia Mar Glidden
Baker Castor Oil Co., Subsidiary of National Lead Co. Brighton Corp. Burgess Pigment Co.	Nov. 77 60	Grac Gr Hars Herc	e Chemace & Chaw Chules Por
Carbola Chemical Co. Carbon Dispersions, Inc. Cargill, Inc. Insert 33 Celanese Corp. of Amer., Chemical		J. M. Hum	len-New ter Chei Huber ible Oil
Div Cellofim Industries. Century Dispersions, Inc Ciba Products, Inc Collway Pigments, Div. of General Aniline & Film Corp.	Nov. 95 3	Pig cul Indu O. G Instr	erial Co iment Co les Powe strial Pour innes ument boratori
Arthur Colton Co. Columbian Carbon Co. Commercial Solvents Corp. Coors Porcelain Co.	Nov. 19 Nov. Nov.	John Kent	nationa s-Manv Machin
Davles Can Co. The J. H. Day Co. Degan Oil & Chemical Co. Diamonite Products Mfg. Co. Dow Chemical Co.	Nov. Nov. Nov. 25	H. K. J. M. The	Karl Kie ohnstan Lehma Mantroe anel Rei
E. I. duPont de Nemours & Co., Inc. (Explosives Dept.).  The Eagle-Picher Co. Eastman Chemical Products Inc. 2nd Cover,	18 20 50, 51	Meta Geor Mine Mine	sap Div. ge A. Merals & C nesota L tional L
Emery Industries, Inc English Mica Co	101		santo ( emicals

INDE	A	OL WALEKIISEKS IN	Ini
Allied Chem. Corp., Plastics Div	Nov. Nov. 12	Enjay Chemical Co., Div. of Humble Oil & Refining Co. Entoleter, Inc. Ertel Engineering Corp. Ethyl Corp.	11, 31 Nov. Nov. Nov.
American Cyanamid Co., Pigments Div	ert 4	W. H. Fales Co. Farnow, Inc. Ferro Corp., Porcelain Div. Filpaco Industries, Inc. Food Machinery & Chem. Corp. Franklin Mineral Products Co. Freund Can Co. General Mills, Inc. General Tire & Rubber Co., Chemical Div.	Nov. Nov. 95 30 41 84 9
	Nov. 81	Georgia Kaolin Co. Georgia Marble Co. The Glidden Co. Grace Chemical Co., Div. of W. R.	
National Lead Co. Brighton Corp. Burgess Pigment Co.	77 60	Harshaw Chemical Co	
	Nov. Nov. 6, 66	Heyden-Newport Chem. Corp. Hooker Chem. Corp. J. M. Huber Corp. Humble Oil & Refining Co.	Nov. 54 Nov.
Div	17 Nov. 95 3 63 Nov. 19	Imperial Color Chemical & Paper, Pigment Color Div., A Dept. of Her- cules Powder Co., Inc	Nov. Nov. Nov.
	Nov.	Johns-Manville Corp	28
Davies Can Co. The J. H. Day Co.	Nov. Nov.	Kent Machine Works, Inc The Karl Kiefer Machine Co H. Kohnstamm & Co., Inc	Nov. Nov.
	Nov. 25	J. M. Lehmann Co., Inc. The Mantrose Corp. McDanel Refractory Porcelain Co Metasap Div.—Nopco Chemical Co George A. Milton Can Co.	Nev. Nov. 39 Nov.
The Eagle-Picher Co	20	Minerals & Chemicals Philipp Corp Minnesota Linseed Oll Co., Subs. of National Lead Co.	53
Emery Industries, Inc. English Mica Co.	61	Monsanto Chemical Co., Organic	78, 79
	****	***************************************	

VERTISERS	IN	THIS	ISSUE	****
mical Co., Div. of	Humble		Monsanto Chemical Co., Plastics Div.	43
fining Co		11. 31	Morehouse-Cowles, Inc	80
Inc		Nov.	Naftone, Inc.	Nov.
neering Corp	*******	Nov.	National Can Co	72
*	*******	Nov.	National Starch & Chemical Corp	21
s Co		Nov.	New Jersey Zinc Co	32
C		Nov.	Newman-Green, Inc.	90
Porcelain Div	*******	Nov.	Nopco Chemical Co	Nov.
lustries, Inc		95	Olin Mathelson Chemical Corp	Nov.
inery & Chem. Con	rp	30	Oronite Div., California Chem. Co	Nov.
lineral Products Co		41	Pacific Vegetable Oil Corp	10
n Co		84	Patterson Foundry & Machine Co	Nov.
Ils, Inc		9	Pennsylvania Industrial Chemical	
re & Rubber Co., C	hemical	,	Corp.	Nov.
		15	Phillips Petroleum Co	Nov. 88
olin Co		Nov.	R-B-H Dispersions Co., Div. of Inter-	00
rble Co		Nov.	chemical Corp	Nov.
n Co.	Ins	ert 45	Reichard-Coulston, Inc.	Nov.
mical Co., Div. of			Reichhold Chemicals, Inc.	92
Co		Nov.	Rohm & Haas Co	Nov.
hemical Co		64	Rona Pearl Corp	106
owder Co			Chas. Ross & Son Co., Inc	89
wport Chem. Corp.		102	St. Joseph Lead Co	Nov.
em. Corp		Nov.	Shawinigan Resins Corp	26
r Corp		54	Shell Chemical Co	6
& Refining Co		Nov.	Shell Oil Co	46
Color Chemical &	Paper,		Signal Oil & Gas Co., Houston Div	48
Color Div., A Dept.			Sinclair Petrochemicals, Inc.	Nov.
vder Co., Inc		Nov.	Skelly Oil Co., Industrial Div	Nov.
Process Engineers.		Nov.	Southern Clays, Inc.	40
Corp	*****	Nov.	Spencer Kellogg, A Textron Co	44, 85
Development		Nov.	Sprayon Products, Inc.	41
al Talc Co		67	Synthetic Chemicals, Inc.	Nov.
			Tamms Industries, Inc.	Nov.
ville Corp		28	Titanium Pigment Corp., Subs. of	1
ine Works, Inc		Nov.	National Lead Co	42
iefer Machine Co		Nov.	Troy Chemical Co	49
mm & Co., Inc		Nov.	Union Carbide Chemicals Co., Div. of	
ann Co., Inc		75	Union Carbide Corp.	22
ose Corp		Nev.	Union Carbide Plastics Co., Div. of	40 40
efractory Porcelain		Nov.	Union Carbide Corp	68, 69
v.—Nopco Chemica		39	U. S. Stoneware Co	70
Allton Can Co		Nov.		
Chemicals Philipp	Corp	53	R. T. Vanderbilt Co., Inc.	96
Linseed Oll Co., S	oubs. of	20	Vulcan-Associated Container Com-	27
Lead Co	Ontant	29	panies, Inc 4th	Cover
Chemical Co., s Div.	Organic	78, 79	C. K. Williams & Co	Nov.
~~~~~~~	****	~~~	******************	PPPPPP



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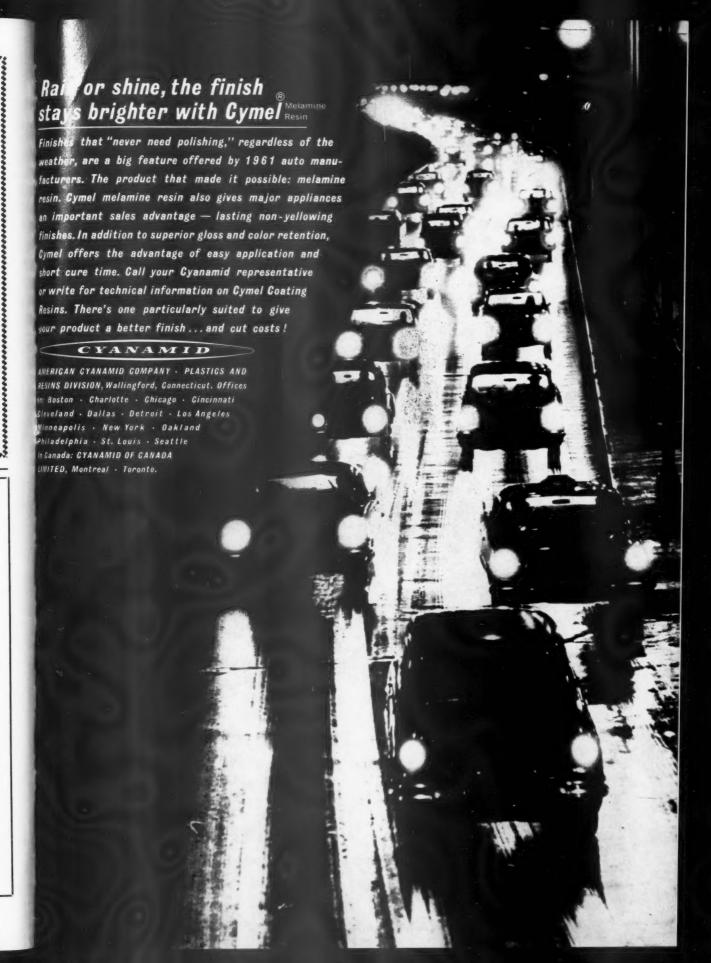


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